GAS JOURNAL

LIGHT ✦ HEAT ✦ POWER ✦ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

VOL. CXC. No. 3494.] LONDON, MAY 7, 1930. [82ND YEAR. PRICE 1s.

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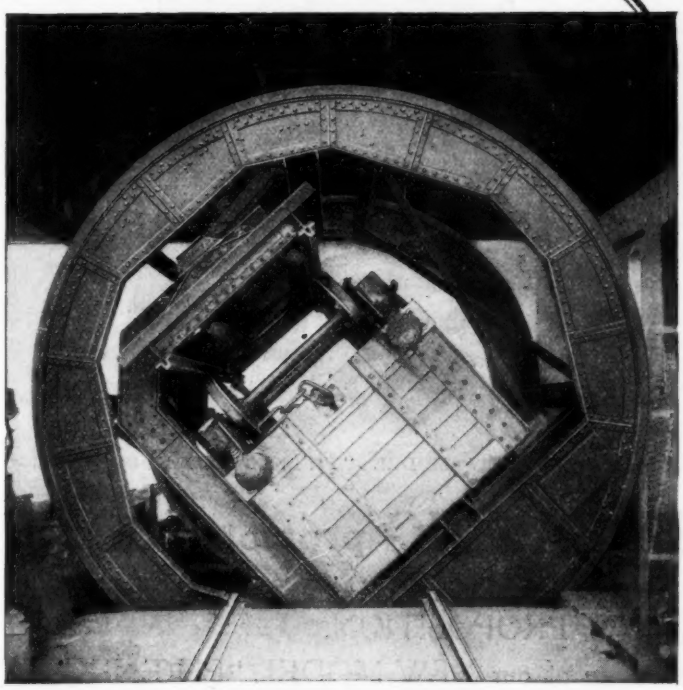
MECHANICAL HANDLING PLANT FOR ALL CLASSES OF MATERIAL.



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This patented Gas Meter strikes an entirely new note. It overcomes the trouble and expense of changing meters to take coins of a higher or lower denomination. It eliminates the work of adjusting the mechanism of existing meters which even then retain only a "one coin" limitation. The "Chelsea Three" will take

PENNIES—SIXPENCES—SHILLINGS

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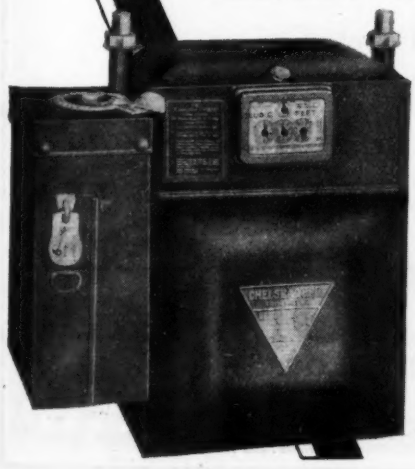

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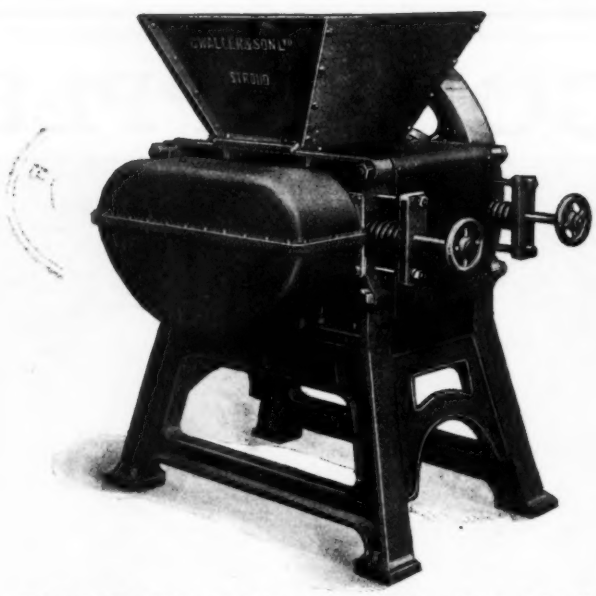

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GREAT STRENGTH and RIGIDITY :: AMPLE CAPACITY
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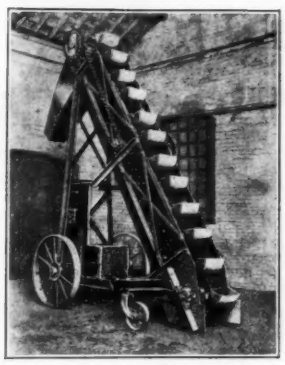

Portable Bucket Elevator. A good substantial and reliable machine.

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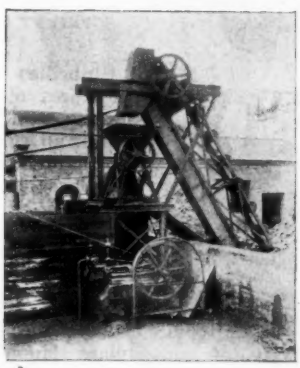
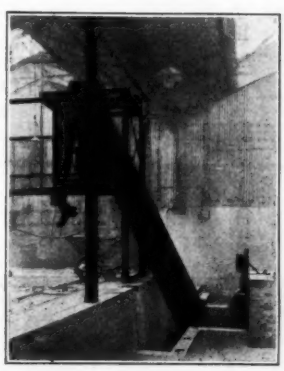


Bucket Elevator working with a coke crushing and screening plant.



Totally-enclosed Bucket Elevator.

A "B.B." Bucket Elevator in use in a gas works.

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Continuous Bucket Elevator for handling ashes.

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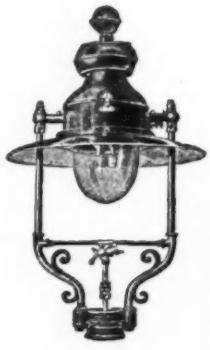

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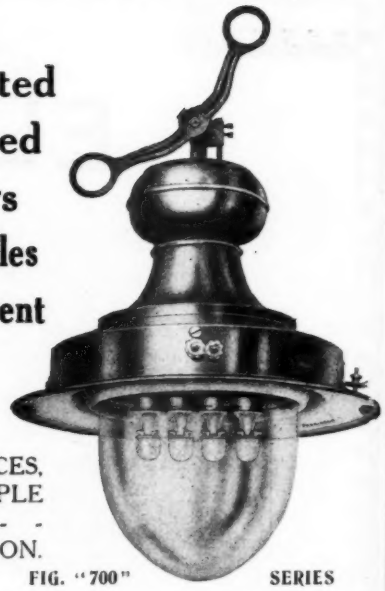

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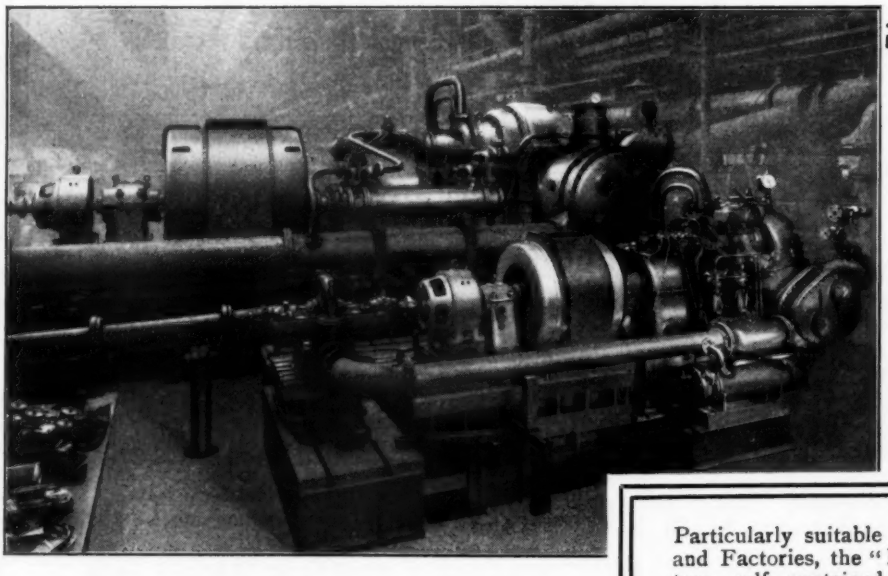

Illustration shows two "Metrovick" combination type Turbo-Generators on test at the Works. They are for outputs of 2,500 kw. and 250 kw. respectively.

METROPOLITAN Vickers ELECTRICAL CO. LTD
TRAFFORD PARK ... MANCHESTER

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Less to Buy—Less to Install—Less to Maintain—Less to Operate—Less to Accommodate.

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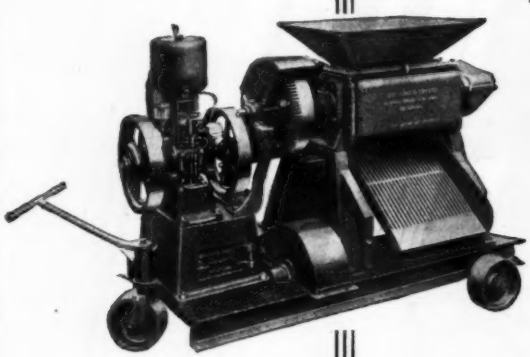
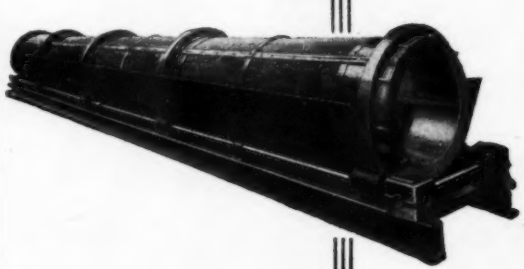


Cort's Coke Cutting and Grading Plant is the outcome of long experience in supplying the requirements of discriminating Engineers. It is

100 °/o VALUE,

not built down to a price, but designed rather to create a standard of quality above competition.

Special attention has been given to the countering of the abrasive and corrosive action of coke wherever it is in contact; thus ensuring the maximum of service at the minimum of Cost for upkeep over long uninterrupted periods.



We appeal to Engineers considering the installation of Coke Handling Plant to bear in mind the foregoing points—and it may be opportune to quote John Ruskin :—

"There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are this man's lawful prey."

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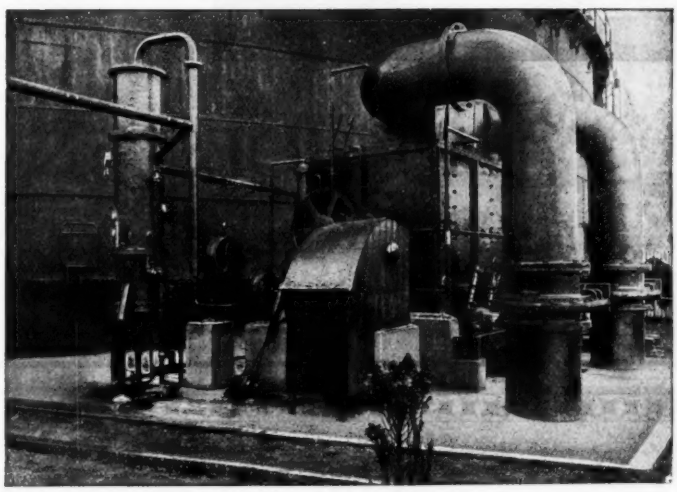

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A REDUCTION OF 75% IN THE HUMIDITY OF TOWN'S GAS CAN BE OBTAINED BY THIS PROCESS

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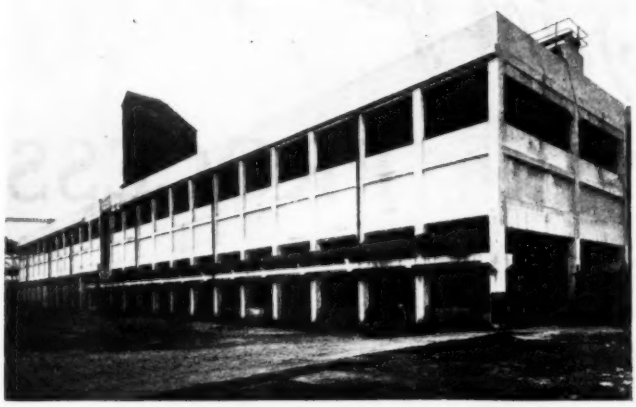

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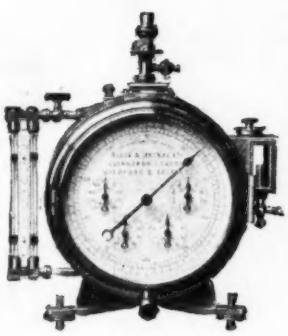

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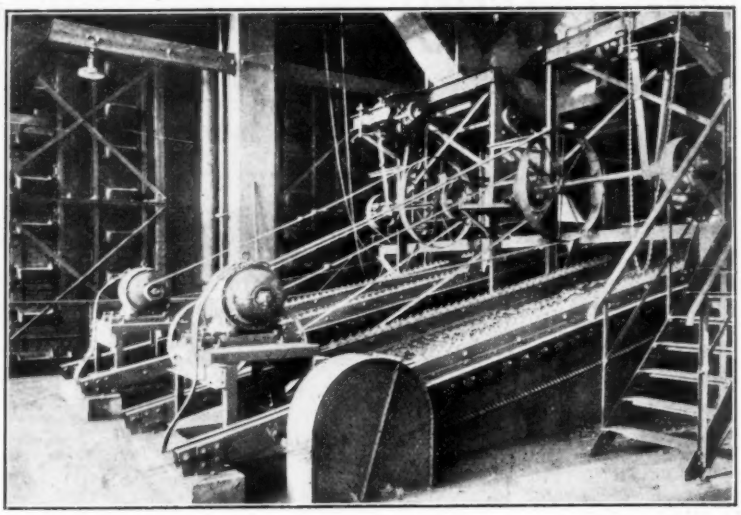

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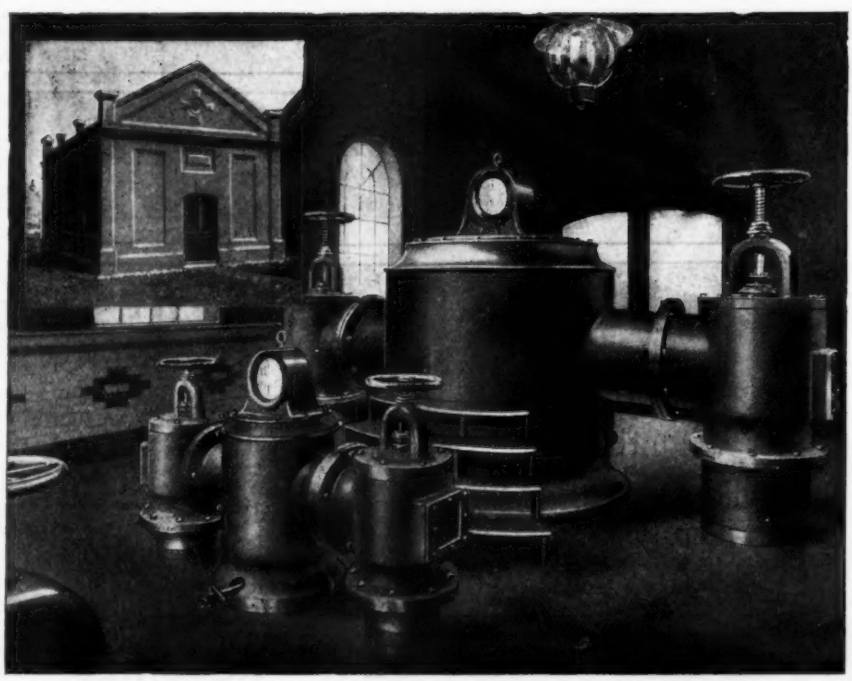

Illustration showing Station Meter House with two Type A Rotary Meters and Valves

THIS INSTALLATION measuring the entire make of purified coal gas, was only ordered after a prolonged test of a Rotary Meter run tandem with a Station Meter of the ordinary Wet Drum Type.

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STANDARD TYPE FOR CLEAN PURIFIED COAL or WATER GAS.

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GAS WASH BOILER

THE NOTED BLUE BOILER

The Boiler that meets with Gas Engineers' requirements.

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mean that a consumer will use gas before any other fuel. You can serve your consumers by installing an "Economic" whenever asked for a gas wash boiler. It is efficient, economical, and satisfies the most exacting requirements. Prices for any quantity will be gladly supplied to any gas undertaking.

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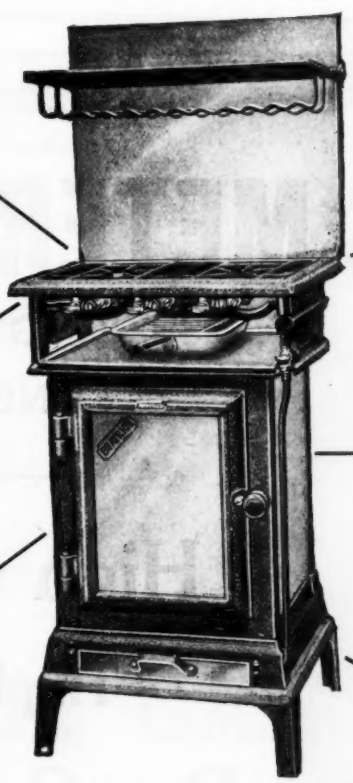
All Enamel Finish and absence of sharp corners or inaccessible recesses means EASY CLEANING.



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Oven lined with special material giving greater insulation than Slag Wool, with proportionate ECONOMY in GAS consumption.

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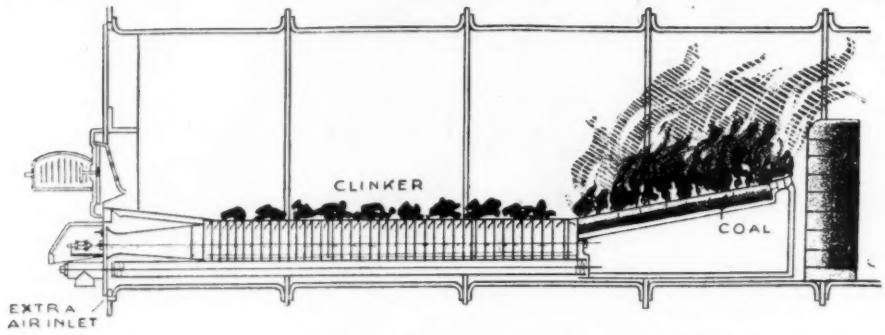

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This apparatus renders the furnace capable of satisfactorily

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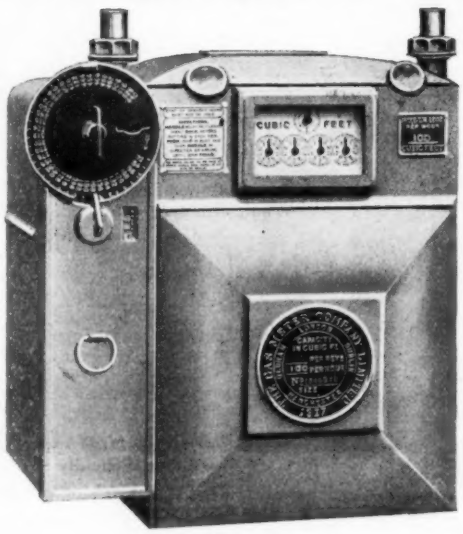

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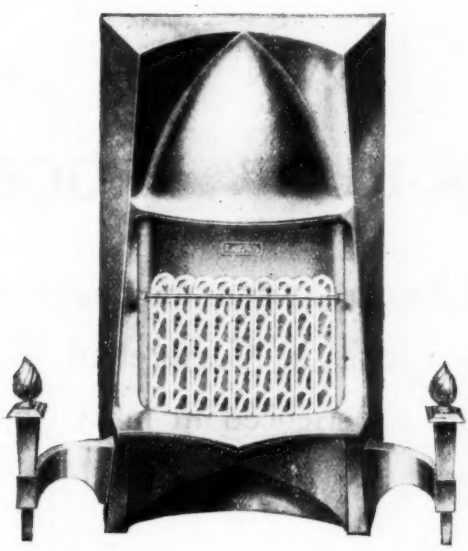

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CONTENTS.

EDITORIAL NOTES.

In the Event of Amalgamation 285
Carbonization and Systematic Control . . 285
Oxide Purification 286
An Acknowledgment 286
A Triumph for Gas—Imperial Continental Gas Association—October Conference of the "B.C.G.A."—Switch on the Gas—Banks for Account Collecting—Barnsley the Free 287
IN TO-DAY'S "JOURNAL" 289

Personal 287
Obituary 287
Gasfitter as Academy Artist 288
Forthcoming Engagements 288
Notes on New Books 289
Amalgamation of Gas Undertakings—Compensation for Loss of Employment . . . 291
Amalgamation of East Surrey and Croydon Gas Companies 291
Teachers' Training Course in Gas Subjects . 291
National Gas Council and Federation of Gas Employers 291
Imperial Continental Gas Association . . 292
The Two-Part Tariff in Operation 292
Leeds' Plan for Meeting Last Year's Deficiency 292
Primitiva Gas Company of Buenos Aires . 292
Wales and Monmouthshire Junior Gas Association—
Annual Meeting 292
New System of Collecting at Barnet . . . 293
Midland Junior Gas Association—
Visit to the Coventry Gas-Works . . . 293
The "M.A.N." Waterless Gasholder. By J. H. Willis, A.M.I.Mech.E. 312
Popular Hospital Savings—The Gasworkers' Point of View 293

"B.C.G.A." Nineteenth Annual General Meeting and Conference at Hull and Bridlington 293
Haywards Heath District Gas Company . . 293
Notes from Scotland 293
Developments at South Cave Sand Quarries . 294
Views of "Housewives-to-be" on the Gas Switch 294
Gas at a Newcastle Trader's Exhibition . . 294
Gas in the Barnsley Council Houses—Views of the National Gas Council 294
Manufacture of Gas-Making Plant Filmed . 295
National Smoke Abatement Society—Public Conference in London 296
North of England Gas Managers' Association—
General Business 297
Extensions to the Purifying Plant at Middlesbrough. By John W. Pallister, Assoc.M.Inst.C.E. 302
The Control of Vertical Retorts. By H. B. Kendrick 306
Low-Temperature Carbonization—Report of Test on the "Babcock" Plant 297
Western Junior Gas Association—
Visit to the Weston-super-Mare Gas-Works 298
Annual Meeting 299
Fire at Newcastle Gas Company's Bye-Product Works 299
Jeffrey Single-Roll Crusher — A Machine Specially Designed for Reducing Material 300
Meter Testing in Manchester—Official Report 300
Glover-West Verticals at Lea Bridge . . . 301
"B.C.G.A." Conference at Ayr—
Gas: The Modern Fuel, and the Fuel of the Future—Discussion 310
Health and Hygiene. By Dr. W. F. Brown 311

COMMERCIAL AND INDUSTRIAL.

Stock Market Report 290
Trade Notes 290
Contracts Open 290
Coal Markets 290
Current Sales of Gas Products 290

PARLIAMENTARY INTELLIGENCE.

House of Lords—
Private Bills 309
Coal Mines Bill 309
House of Commons—
Private Bills 309
Special Orders 309

REGISTER OF PATENTS.

Oven Thermostats—R. & A. Main, Ltd., and Wortley, G. W. 315
Gas Water Heaters—General Gas Appliances, Ltd., and Coleman, F. S. 315
Gas Valves—Falkner, A. J. 315
Applications for Patents 315

MISCELLANEOUS NEWS.

Board of Trade Inquiry at Colchester . . 316
Gas Acts (1920 and 1929) Orders 316
Stock and Share List 317

PARAGRAPHS.

American Chamber of Commerce—Proposed New Sulphate Plant for Droitwich . . . 289
South African Lighting Association Dividend—Tenders for East Hull Stock Issue—Exhibition of Appliances at Darwen—North of England Gas Managers' Association (Auxiliary Section)—Electro-Gas Development Company—Gas Consumption at Lytham St. Annes—Royal Sanitary Institute—New Issue of Capital at Harpenden—Southampton Stock Issue—Gosport Stock Issue—Manchester Technology Research Scholarships—Hong Kong and China Gas Company—Harrogate Gas Company's Capital—Manchester District Institution of Gas Engineers 295
Cookery Demonstrations at Bradford—Coke Oven Gas in Leeds 314
Hampton Court Stock Issue—Cardiff Gas Staff Benefits Scheme — Price Reduction at Ulverston 316

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GAS JOURNAL

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VOL. CXC. No. 3494.] WEDNESDAY, MAY 7, 1930. [82ND YEAR.

Editorial Notes.

In the Event of Amalgamation.

THOUGH the whole must be greater than a part, and therefore the welfare of the industry must be considered before that of any member, it is undoubtedly desirable that the interests of both should, as far as is practicable, be the same. When everything is proceeding normally, this pleasing state of affairs is easy of attainment; but some development or a change of policy may as easily shift the balance. In the event of amalgamation, for instance, though the undertaking as a whole, and also the general body of consumers, substantially benefit, there may be cases of individual hardship among employees. "How shall I be affected?" is a very natural question for a man to ask himself, when the possibility is mooted of the concern with which he is engaged being taken over by another; and the answer cannot invariably be altogether re-assuring, when consideration is given to the feature which largely influences so many amalgamations.

It is for this reason that we are pleased to note a scheme providing for compensation to gas workers for loss of employment due to amalgamations of undertakings. This scheme (prepared by a small Sub-Committee set up for the purpose) has been agreed upon by the National Joint Industrial Council for the Gas Industry, who have thus removed, or at any rate greatly lessened, a frequent cause of objection. Not only employees, but shareholders also, will welcome provisions of the kind which are contained in the Joint Industrial Council's scheme, as set out in later pages of the "JOURNAL." Benefit is to accrue to those who have been in continuous service of an amalgamating undertaking for three or more years, and who, in consequence of the amalgamation, suffer loss of employment or diminution of wages. For long-service men of over fifty years of age, the compensation will reach a very substantial figure. Proposals for amalgamation are likely to become more rather than less frequent, and a scheme which, like this one, extends the principle of compensation to gas workers has our hearty approval.

Carbonization and Systematic Control.

IT is obvious from the paper on vertical retorts, which he read at last Friday's meeting of the North of England Gas Managers' Association, that Mr. H. B. Kendrick has studied the process of continuous carbonization uncommonly closely, and has brought to bear on his work a telling blend of theory and practice. Mr. Kendrick is now Engineer and Manager to the Conway Gas Department. Prior to March of this year he was with Mr. Blundell at Carlisle, and it was while he was at Carlisle that he gained the Institution Diploma. We record this fact first because we are impressed by the clear, non-padded manner in which he sets-out his ideas. His paper, printed on later pages of this "JOURNAL," is of reasonable proportions, and its quality is added evidence of the validity of our oft-repeated contention that the worth of a technical contribution or an address is not to be assessed in direct proportion to its bulk. Secondly, we suggest that what may be termed Diploma discipline is, at any rate in part, responsible for this considerable improvement in technical story-telling; the influence of this discipline will, we are sure, be felt generally in years to come.

However, our readers do not want a sermon; they want something practically useful, and they will find it in Mr. Kendrick's paper, which is concerned with continuous carbonization, and more particularly with the Glover-West installation of vertical retorts which started gas-making at the Rome Street Works of the Carlisle Corporation eight years ago. During the first three years of their operation, the average gas yield per ton of coal carbonized was 84 therms; in the last two years it has been 90 therms. This in itself is more or less meaningless, but its significance becomes clear when the statement is added that the quantity of saleable coke has increased, other bye-products have not diminished in quantity, and the figure for coke to producers shows a reduction. Whence the miracle? It is no miracle; these results are the outcome of continuous scientific control of continuous scientific carbonization, and the application of a few ideas dictated by analytical scrutiny of a process which is peculiarly sensitive to technical supervision.

Not all Mr. Kendrick's ideas are new, but practically all deserve emphasis, just as his practice deserves emulation. He rightly condemns strongly the method of altering gas quality by increasing the vacuum in the gas stream coming from the retort; in support of his view he draws a carbonizer's inferno of the dire results which follow this abuse of scientific principles. He then goes on to discuss whether it is best to control the quality by varying the speed of passage of the coal through the retort or by altering the proportion of steaming; and he expresses the opinion that the quantity of steam should be adjusted to the temperature of the retorts, and the final fine adjustment for quality should be effected by modification of the throughput of coal. Regarding this, readers will note the method which has been adopted at Carlisle. As for the general question of steaming, he points to the adverse effect on the efficiency of the plant of steaming to an extent unwarranted by the temperature of the retorts and the quality of coal; and he smiles good-naturedly at the "sweeping-out of hydrocarbons" notion.

Of great practical interest are Mr. Kendrick's remarks on the effect on the calorific value of the gas of variations in the voltage of the electricity supply when the plant is electrically driven. In this regard, Table II. is an unusual one. We ought also to call attention to the author's modifications to the producer gas uptakes, to force the

pressure lower down, which alterations have effected a considerable saving in fuel. The vacuum on the settings has been reduced to such an extent that all the circulating chambers are under a comparatively heavy pressure, so that uncontrolled air cannot be drawn in to combust any excess carbon monoxide or coal gas from leaky retorts. Also, the lowering of the vacuum in the heating chambers naturally tends to minimize the leakage of coal gas from the retorts. Mr. Kendrick thus is led to ask the question, "Why not balance the internal and external retort pressures?" and the concluding part of his paper is concerned with an attempt to arrive at the probable cost of working under pressure. From his assumptions and calculations, he puts forward a net saving of 0·64d. per therm as the result of adopting blowers. He does not suggest, of course, that under-pressure working could be applied to plants as built at present.

Oxide Purification.

If any of our readers want to know the costs of a sulphur-removal plant at the present time, of a capacity of 4½ million c.ft. of gas per day, they will find all the necessary detailed information in this issue of the "Journal." This information is set out by Mr. J. W. Pallister in a paper which he read at the annual meeting of the North of England Gas Managers' Association last Friday, and it is interesting not merely as a demonstration of engineering ingenuity, but also as an indication, like that of the paper by Mr. Kendrick which we have already noticed, of the growing appreciation and application of scientific control to gas manufacture. To illustrate what we mean, we may mention that pressure gauges and thermometers are fitted to every new box installed at Middlesbrough—the undertaking with which Mr. Pallister is concerned. Also, the air for revivification *in situ* is measured by meter, and is constantly admitted by means of a small exhauster; again, the moisture content of the oxide is assessed, adjusted, and, most important of all, kept constant. Determinedly, we mention these facts, because temperature, air admission, and correct water content of the oxide have such an important bearing on the oxide purification process.

The new purifiers at Middlesbrough are worked on the backward rotation system, the sequence being changed usually every day; and the new oxide is normally worked up to 50 p.ct. sulphur content in two or three foulings. As for the purifiers themselves, Mr. Pallister explains that no hesitation was felt in deciding to construct the new plant of the elevated type with overhead revivifying floor, "partly owing to economy in working of the existing "elevated boxes as compared with those at ground level, "but chiefly owing to the limited space available." The oxide purification process is cheap as a process—for example, with the old purifiers at Middlesbrough, the cost per therm of gas for the year ended March 31, 1928, was only 0·025d. It is the cheapness of operation which is apt to cloud a proper perspective of the possible savings; and we feel it necessary to emphasize once again the value of the site occupied by oxide boxes, more particularly in view of other possible uses as the output of gas expands. Yard area, as the author remarks, is frequently a serious matter on a gas-works. To our mind, it ought always to be a serious matter, if the future is being properly cared for; and we call attention to Mr. Pallister's observation that a point to remember when comparing the capital cost of purifiers at ground-level with that of elevated boxes and revivifying floor is that the latter arrangement gives two additional floor areas for the storing and handling of oxide, and the value of this additional land should be offset against the cost of boxes at ground-level.

We realize, of course, that the author limited himself to a thoroughly practical detailed description of a particular plant. His remarks on the use of soda-ash as a preventive against corrosion of the bottom-plates, with concomitant cyanogen removal, reveal, however, that wholly desirable mingling of the engineer and the chemist. And, in view of the author's insistence on a reasonable assessment of purifying site, we should have liked a little more of this engineer-chemist combination. Even within the narrow limits of his paper, we should have appreciated some reference to the material employed for sulphur removal, for we are convinced that, given adequate scientific control—which is obviously the case at Middlesbrough—the cost of purification per therm of gas made depends more than anything else on the choice of a material which shows the greatest activity, the greatest capacity, and the least labour costs. It is a corollary to this that such a material utilizes the available site to the best advantage.

An Acknowledgment.

It is safe to say that for a journalist to endeavour to live on praise would be a lean proposition; and when anything of the kind does come along, this renders it the more acceptable. It is thus a real pleasure to note that, in their report for the session now concluding, the Council of the Wales and Monmouthshire Junior Gas Association say that "a special word of praise to the Editor of "the 'Gas Journal' would perhaps not be out of place, "for the publication of our monthly meetings, including "the authors' papers and the discussion matter." While it is perfectly true that a large demand upon space is made by the reports of the proceedings of the Junior Associations, the "Journal" has, in this respect, consistently performed, for the past quarter of a century and more, to the utmost limits of its power, what it has regarded as a duty to the industry, by the publication of the proceedings at the meetings.

The Editor of the "Journal" has had his real reward in the knowledge that the movement, with which he has been actively identified from the very commencement, has been of incalculable benefit both to the juniors themselves and to the industry in which they are engaged. How many men have added to their own store of knowledge through the research necessary for the preparation of papers or addresses; and how many more have gained through listening to them? While as for the art of public speaking, every authority has assured us that this can only be acquired by practice. Then, again, there is the practical demonstration offered by the periodical visits to works, &c., which are arranged. These are the advantages that the Associations themselves offer to the Juniors—with one other, which comes through such publicity as the "Journal" has so consistently afforded. The Junior can now appear before the footlights on the Great Stage, in a manner which was not available to him in former times; and who shall assess the value to him of this? It is, too, of equal advantage to the industry at large that those possessing merit should have every opportunity of showing it. A big proportion of the men who now comprise the front ranks of the industry have been at one time or another closely identified with the Junior Association movement.

But the best of intentions must have regard to material facts; and if the "Journal" is to continue to play the part that has been indicated here, then the Junior Associations should afford what assistance they can by submitting addresses and papers of reasonable dimensions, and containing only matter that is likely to be of general value. To make a contribution suitable for an individual Association, repetition of matter that is already more or less common knowledge may be unavoidable; but when this is the case, it should not be too much to expect the author to submit an abbreviated form for publication. Under existing conditions large demands are made upon the time of the "Journal" staff; and though these are cheerfully met in a good cause, it is felt that the adoption of some such suggestion as this would prove more generally satisfactory.

Looking back over its history, there will probably be universal agreement with the assertion that the Junior Association movement has been among the most remarkable of the industry's successes. From small beginnings, there has been continuous growth both in numbers and in enthusiasm; while the technical fare gives no hint of falling off in either quantity or quality. Each session's work produces a volume of "Transactions" comparable in size with the Senior "Annual Reports of District Gas Associations;" and the distribution of the Junior book has increased year by year, until for the 1929-30 session the number of volumes being printed has reached over twelve hundred.

A Triumph for Gas.

The Works Committee of the Lewisham Borough Council, having considered the effects of the systems of lighting recently installed in Loampit Vale, High Street, Lewisham, Rushey Green, and Bromley Road (see "JOURNAL" for March 26, April 2, 9, 16, 30), have decided to recommend "that the Council do adopt central high-pressure gas lighting as the standard lighting for all main roads in the Borough over 50 ft. in width, with the exception of the roads at present lit or to be lit with electric light."

Imperial Continental Gas Association.

It is anticipated that the accounts of this Company will shortly be published. The Chairman, in his last address to the stockholders, explained that the accounts would cover a period of fifteen months from Jan. 1, 1929, until March 31 last, in order to enable the dividends of the subsidiary Companies, declared after Dec. 31, to be brought into the accounts. This change was consequent upon the conversion of the directly-owned branches of the Imperial Continental Gas Association into subsidiary companies. The profits of the branch establishments were formerly made up as on Dec. 31, and could therefore be brought into the old twelve months' accounting period, owing to the conversion of these branch establishments into subsidiary companies, they are not in a position to declare their dividends until after Dec. 31. In consequence, the accounts are, by way of exception, this year being kept open for a period of fifteen months. They will not cover the earnings of the subsidiary companies for fifteen months, but only for a period of twelve months, and will therefore be strictly comparable with the last accounts which cover only a period of twelve months.

October Conference of the "B.C.G.A."

May is to be a busy month of meetings—so busy, in fact, that there is some over-lapping, which in less crowded times our list of "Forthcoming Engagements" makes it possible to avoid. Then the close will see the members of the industry setting their faces towards Leeds. The vacation period will follow on after the World Power Conference in Berlin, and next we shall be looking forward to the nineteenth annual general meeting of the British Commercial Gas Association. This is to take place under the Presidency of Mr. Henry Woodall in Hull and Bridlington. October is still some way off, but those intending to be with the "B.C.G.A." will doubtless make early arrangements for their accommodation in Bridlington, which will form the residential quarters of the conference. The full programme is in course of preparation, but there is no need to wait for that before deciding to take part in the proceedings.

Switch on the Gas.

The convenience of switching on and off a light is one that is highly valued by users; and it was a pleasure to refer in last week's "JOURNAL" to the plan adopted in the Halifax Gas Department, whereby Mr. W. B. McLusky arranges to provide, deliver, and fix a pendant or bracket, complete with burner, mantles, and glass, and a "Newbridge" positive switch, all for twelve payments of 2s. 6d. per quarter. The Department maintain the installation, and give the consumer two mantles free per annum, the maintenance being continued after the quarterly payments cease. This is an excellent idea, and other ways of introducing the gas switch are also desirable. At exhibitions one always finds this ability to operate gas burners to be an outstanding attraction, because visitors unceasingly manipulate the switches. This attraction received further emphasis when the Wigton Gas Company, in connection with a recent gas exhibition, offered prizes for essays by school children on "What interested me most at the exhibition, and why." Here the gas switch received a large amount of attention—a fact of which sight should not be lost by gas managers and salesmen. "Switch on the gas" is a good slogan, and it is one which can be used effectively in further popularizing gas lighting.

Banks for Account Collecting.

The Barnet District Gas and Water Company have ceased door-to-door collection, and arrangements have been made by which payment can be made (1) by remittance by post to the Company's offices, (2) by payment at their showrooms, or (3) by payment at the counter of any branch of the Westminster Bank, Ltd. When so many families do not keep servants, and both houses and flats are left for varying periods unoccupied, house-to-house collection must necessarily involve many fruitless calls; while, on the other hand, showrooms and bank branches are always available during business hours. Attached to the account as a perforated slip is a form of receipt which reduces to a minimum the amount of labour required. Bank branches are becoming so numerous that arrangements of this character should prove a great convenience. Indeed, we are quite prepared to learn later on that the Barnet scheme has proved itself an all-round success.

Barnsley the Free.

We have already seen that to be the tenant of a Barnsley Council House is to risk some sacrifice of liberty, which is hardly what one should be entitled to expect, seeing that the Town Council is made up of a Socialist majority. So far, however, from practising what they preach, these Socialists have adopted a policy which, as Mr. W. J. Smith, the Secretary of the National Gas Council, says in a letter, "savours of feudalism." The Gas Company, as he shows, have merely carried out an obligation laid upon them by Parliament; while the tenants have merely expressed a preference in the matter of light and heat sources. Yet threats of eviction were lately uttered, which happily have been referred back to the Committee who originated them. Such a method of obtaining custom for their own electrical undertaking as this effort to prevent the tenants using gas constitutes must be repellent to all fair-minded people. It is a curious commentary on the professions of Socialists.

Personal.

The entire gas industry will learn with deep sorrow of the very serious illness of Mr. SAMUEL GLOVER, of St. Helens. For some time he has been ailing, and is now confined to his room, suffering from severe heart trouble. Our sympathy is extended to him in his illness.

Among the awards made for essays submitted in connection with the Ceramic Society's Wedgwood Bi-centenary Competition for a paper on the technical achievements of Josiah Wedgwood, the first prize (of 35 guineas) went to Mr. A. T. GREEN, A.I.C., A.M.I.Chem.E., F.Inst.P., of Newcastle.

Obituary.

The death has to be recorded of Mr. JOHN ELLIS, of Batley, at the age of 65 years, who for 49 years was in the service of the Batley Corporation Gas Department, prior to his retirement from the position of Chief Clerk and Cashier four years ago. On his retirement he was presented by his fellow officials and the employees of the Department with a handsome timepiece, with Westminster chimes, as a mark of their esteem. He was the son of Richard Ellis, who was himself employed at the Batley Gas Undertaking, and he spent his entire working life in that undertaking.

The death occurred on April 28 of Mr. CHARLES T. B. ROPER, Mains Superintendent to the Bradford Corporation Gas Department. Mr. Roper was the victim of a long and serious illness in 1926, from which he apparently recovered. He was, however, again taken ill in 1928, and has been more or less an invalid ever since. Aged 51 years, he was brought up in the Bradford Gas Undertaking, and served all his working life there. He was one of the originators, over a quarter of a century ago, of the Yorkshire Junior Gas Association, when it was created out of the classes held in Bradford in those days by Mr. Cranfield. Mr. Roper continued to take a keen interest and active part in the Yorkshire Junior Association, serving various terms as Secretary, President, and Treasurer, and he has been on the Council practically throughout. He was a member, from the inception, of the West Yorkshire Section of the British Commercial Gas Salesmen's Circles, served some years as Hon. Secretary of the Joint Council of British Junior Gas Associations, and was a member of the Yorkshire District Education Committee under the Education Scheme of the Institution of Gas Engineers. He is survived by a widow and one daughter.

XUM

Gasfitter as Academy Artist.

MR. ERNEST GILLAM, A GASFITTER, AND AN ARTIST IN HIS SPARE TIME, WHOSE PICTURE "CROSSING THE RIVER" HAS BEEN HUNG FOR THE ROYAL ACADEMY EXHIBITION.

The "Daily Mirror" for Saturday last had an account of the painting of Mr. Ernest Gillam, who, it was stated, has worked as a fitter for the Gas Light and Coke Company for fourteen years. A water colour, painted partly by gaslight, by Mr. Gillam, has been accepted and hung by the Royal Academy.

Apart from his schooldays, it was stated by a "Daily Mirror" correspondent, Mr. Gillam has never had a painting lesson in his life. In the evenings and at week-ends he used the music-rest of his piano as an easel.

"For years," he said, "after finishing work, it has been my delight to sit down and paint. During the war I served in Russia, and there I found plenty of material for my sketch-book, while often at week-ends I go for a trip into the country, and have become so familiar with sheep, cows, and other animals that I can paint them in a few minutes from memory.

"Do I find working by gaslight a disadvantage?

"Not in the least. Gas gives me a fine, soft light for my work, and is far better than electricity. Really, I prefer to work in oils, but I simply can't afford it because of the price of the canvas."

Forthcoming Engagements.

May 13.—British Commercial Gas Association.—Executive Committee Meeting, London, 2.30 p.m.

May 14.—Institute of Fuel.—Meeting at Burlington House, Piccadilly, Dr. E. W. Smith presiding. Paper by Mr. C. M. Walter on "The Utilization of Town Gas as a Fuel in Heat Treatment Furnaces."

May 15.—Midland Junior Gas Association.—Annual Meeting, Council House, Birmingham.

May 15.—Midland Association of Gas Engineers and Managers.—Spring general meeting at Bromsgrove.

May 16.—Eastern Counties Gas Managers' Association.—Spring Meeting at Harwich.

May 16.—Society of British Gas Industries.—Council meeting in the morning.

May 16.—Society of British Gas Industries.—Annual General Meeting and Dinner, Hotel Metropole, London.

May 16.—Manchester District Institution of Gas Engineers.—May Meeting at the Midland Hotel, Manchester, 3 p.m. Paper by Mr. H. C. Widlake, of Plymouth, on "The Electrical Fusion of Gas Pipes."

May 17.—Yorkshire Junior Gas Association.—Visit to Messrs. Stainsby & Lyon, Ltd., Tar Distillers, Knottingley. Paper by Mr. Billbrough on "Tar Distillation." Also a visit to Messrs. Bagley & Co., Glass Works.

May 21.—Wales and Monmouthshire Institution of Gas Engineers and Managers.—Meeting at Caerphilly.

May 21.—British Commercial Gas Association.—General Committee Meeting, London, 2.30 p.m.

May 23.—British Commercial Gas Association.—Lancashire District Conference, Morecambe.

May 24.—North of England Gas Managers' Association (Auxiliary Section).—Half-yearly meeting at West Hartlepool.

May 27.—National Gas Council.—Meeting of the Central Executive Board, at 12 noon, at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2.

May 27.—Federation of Gas Employers.—Meeting of the Central Committee, 11 a.m., at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2.

May 27.—National Gas Council.—Annual Meeting, Incorporated Accountants' Hall, Victoria Embankment, W.C. 2. 2.45 p.m.

May 27.—Federation of Gas Employers.—Annual Meeting, Incorporated Accountants' Hall, Victoria Embankment, W.C. 2. 2.15 p.m.

May 27.—Southern Association of Gas Engineers and Managers (Eastern District).—County meeting at Maidstone, at the Royal Star Hotel, 12.30 p.m.

June 2-5.—Institution of Gas Engineers.—Annual Conference in Leeds.

Aug. 19 and 20.—Irish Association of Gas Managers.—Meeting at Tralee.

Oct. 27 to 29.—British Commercial Gas Association.—Annual Meeting at Hull and Bridlington.

In To-Day's "Journal."

Gasfitter as Academy Artist.

A photograph is reproduced to-day of Mr. Ernest Gillam, who, we understand, has worked as a fitter for the Gas Light and Coke Company for fourteen years. A water-colour he has painted has been accepted and hung by the Royal Academy. Mr. Gillam stated that he did part of his painting by gaslight, as it gave him a fine, soft light for his work.

* * * *

Compensation of Displaced Gasworkers.

Outlined on later pages to-day is a scheme, which has received the approval of the National Joint Industrial Council for the Gas Industry, providing for compensation of gasworkers for loss of employment due to amalgamations of gas undertakings. In the case of elderly employees with a long period of service standing to their credit the compensation will amount to a substantial sum.

* * * *

Extensions to the Purifying Plant at Middlesbrough.

The North of England Gas Managers' Association, at their Annual General Meeting in Newcastle on May 2, heard a very interesting account of extensions to the purifying plant at Middlesbrough, by Mr. J. W. Pallister, Assoc.M.Inst.C.E. The new structure consists of three floors—ground floor, purifier floor, and revivifying floor. The purifiers are worked on the backward rotation system, the sequence being changed usually once a day, and the new oxide is normally worked up to 50 p.ct. sulphur content in two or three foulings. Mr. Pallister gives a schedule of costs for the new plant.

* * * *

The Control of Vertical Retorts.

Mr. H. B. Kendrick, Engineer and Manager to the Conway Gas Department, took his listeners back for a while to his old works at Carlisle, when he discussed, before the North of England Gas Managers' Association, on May 2, some details of the control of vertical retorts, with special reference to practice at Carlisle. It should be pointed out, said Mr. Kendrick, that in the daily practice of the gas-works it is very seldom a question of altering the calorific value of gas made over wide limits. The alterations are not from 450 to 500 B.Th.U.; they are from (say) 445 to 452. And he is of opinion that the quantity of steam should be adjusted to the temperature of the retorts, and that the final fine adjustment to the temperature of the retorts should take the form of an adjustment of the throughput of the coal.

* * * *

Glover-West Verticals at Lea Bridge.

An article describes an installation of Glover-West verticals at Lea Bridge, together with details of the handling and ancillary plant. The Company, it is stated, are adding 1500 new consumers a year, and have now 36,000 consumers. For the year 1929 the make of gas was 1043 million c.ft. One of the features of the plant is a 20-ton side discharge wagon tippler by which the wagon and platform are turned on a pivot about 6 ft. above ground level, and the coal is shot into a hopper arranged at ground level. Another feature of the installation is a water-softening plant in which only soda is used, and the rest of the treatment is assisted by a continuous return device, whereby water is continually returning from the boiler to the softening plant, and the heat obtained from this water completes the treatment, and water of 2° hardness is obtained at very small cost.

* * * *

The "M.A.N." Waterless Gasholder.

The Midland Junior Gas Association, on April 17, learnt a great deal regarding the "M.A.N." type of waterless holder from Mr. J. H. Willis, of Messrs. Alexander Comley, Ltd. (who are agents for the Waterless Gasholder Company). On the question of the cost of pumping tar to the seal, the author observed that it is negligible. Here is a quotation from his paper: "A waterless holder of 1 million c.ft. capacity operating in this country at present consumes an average of 18 electrical units per week; while one of about 900,000 c.ft. capacity has recorded a current consumption as low as 218 units in a year. The tar seal in practice has proved itself to be thoroughly reliable and satisfactory. Inquiries made in several quarters during the severe winter of 1928-29 showed that no trouble whatever was experienced. Not every gas engineer could say the same of his water-sealed holders." In the "M.A.N." holder the whole structure is designed with a safety factor of 4, and to withstand a wind load of 40 lbs. per sq. ft. or more as may be required.

* * * *

Western Juniors at Weston-super-Mare.

Prior to the Annual General Meeting of the Western Junior Gas Association at Weston-super-Mare on April 26, when Mr. J. T. Spencer read his Presidential Address (which was published in the "Journal" last week), the members inspected the Weston Gas-Works. The carbonizing plant consists of two benches of horizontal retorts. An interesting feature is the automatic control of the calorific value of the gas produced, by mechanism which governs the steam supply to the exhausters, working in conjunction with a "Sigma" recording calorimeter. The operation of this instrument, it is stated, results in a considerable reduction in the variations of the quality of gas produced from the retorts. We give a report of the business meeting, in addition to a brief description of the works.

* * * *

Report of Test on the "Babcock" Plant.

A review is published of the test by the Director of Fuel Research on the "Babcock" low-temperature carbonization plant installed at the Dunstan Power Station of the Newcastle-upon-Tyne Electric Supply Company, Ltd. In this process coke is applied for steam raising, together with some 38,000 c.ft. of gas per ton of coal at the very low calorific value of 70 B.Th.U. per cubic foot. The amount of tar obtained is about the same as what would be realized in any standard carbonizing plants.

Notes on New Books.

"ELECTRICIAN" ANNUAL TABLES.*

The 1930 issue of the "Electrician" Annual Tables, which is the forty-third year of the series, is as complete as usual—containing, as it does, details with regard to no less than 800 British and 1300 Dominion, Colonial, American, and foreign electricity undertakings of all kinds. The tables are, of course, well known, and must be indispensable to electricians. To the gas industry they are also of value—principally because of the price figures included, and the details given of the services which individual undertakings are prepared to render. Practice is seen to vary widely in different places. Comparisons are facilitated by the addition to each set of figures of the price of gas per therm in the town referred to. From practical knowledge of the difficulty of compiling such statistics as are here presented, we are able to compliment the Editor upon the manner in which he has performed his task.

* "'Electrician' Annual Tables of Electricity Undertakings." London, Ernest Benn, Ltd. Price, 10s. net; postage 9d. extra.

American Chamber of Commerce.

The April issue of "Anglo-American Trade," published by the American Chamber of Commerce in London, contains a verbatim report of the luncheon address on March 18 of Sir David Milne-Watson, LL.D., D.L., Governor and Managing-Director of the Gas Light and Coke Company. The address formed the subject of an article in the "Journal" dated March 25.

Proposed New Sulphate Plant for Droitwich.—At a meeting of the Droitwich Lighting Committee recently a plan for the extension of the gas-works was discussed. The Gas Manager (Mr. C. C. Siddaway) reported that it was impossible to carry on with the existing plant for the making of sulphate of ammonia, and recommended that the Council should apply for a special order sanctioning the installation of up-to-date plant. The new plant would cost about £800. If it was installed it would be possible to make 50 tons of sulphate per year instead of 20 tons. The Mayor proposed that the matter should be referred back for a month for a full report and estimate of profits. This was agreed to.

Commercial and Industrial.

Stock Market Report.

[For Stock and Share List, see later page.]

The further reduction in the Bank Rate last week from 3½ to 3 p.ct., and the consequent meagre 1 p.ct. Bank Deposit Rate, should give a fillip to Stock Exchange business generally; but at the time of writing the gilt-edged market has been the only one to show any appreciable movement.

Gas stocks and shares had a fairly quiet week, though prices on the whole remained steady. In some instances they exceeded those of the previous week; among these being the Bombay £1 shares and Gas Light £1 units. There were few changes in the quotations. Alliance and Dublin and South Metropolitan ordinary stocks each gained a point to 94½ and 103 respectively, and Cambridge 5 p.ct. debenture also hardened 1 to 93½, while European £10 shares dropped a point to 14. An outstanding item of interest was the announcement by the Imperial Continental Gas Association of a final dividend on the old capital stock of 12½ p.ct., making 17½ p.ct. for the 15 months to March 31, against 15 p.ct. for the previous year. The accounts show a balance on profit and loss account of £468,238, against £387,259. The Directors of the Montevideo Gas and Dry Dock Company, Ltd., have called an extraordinary general meeting for the purpose of adopting new Articles of Association, increasing the capital of the Company from £600,000 to £675,000, and capitalizing £75,000 of the reserve.

The accounts of the Colombo Gas and Water Company, Ltd., for the year to Dec. 31 have also been received, and show highly satisfactory results. The report states that the sales of gas have increased by 15 p.ct. A final dividend of 5 p.ct. (free of tax) has been recommended, making 10 p.ct. (free of tax) for the year. This rate has been distributed since 1923, together with a capitalized bonus in 1925 of 33⅓, and in 1928 of 25.

The Directors of the Hong Kong and China Company are recommending a dividend for the past year at the rate of 10 p.ct. (less tax). From this will be deducted the interim dividend of 5 p.ct. (free of tax) paid in October last. The same rate was paid for 1928 free of tax.

The Southampton Company are inviting tenders for £100,000 5½ p.ct. preference stock at a minimum price of £97 10s. p.ct. Applications will be received up to May 19.

Trade Notes.

Fletcher Russell Gas Cookers.

The new cooker catalogue of Messrs. Fletcher, Russell, & Co., Ltd., of Palatine Works, Warrington (Proprietors, Radiation Ltd.), is well up to its usual standard of excellence. Full particulars of the firm's leading lines in cookers and hotplates are given, including details of the latest innovations and accessories. The features of the "Kingsway New World" cooker are given particular attention.

A New Renold Chain Clutch.

A booklet has recently been published by Hans Renold, Ltd., of Manchester, dealing with a new chain clutch that the firm have now ready for use in conjunction with Renold standard stock chain drives. With the advent of this clutch they claim to have provided the equivalent of a fast and loose pulley arrangement for chain drives. Two sizes are available, covering power ranges from 1 to 50 H.P. The clutches are self-acting, and suitable for either gradual or quick engagement; they will revolve in either direction, and, due to their high pick-up load, can be used with any type of motor.

Another Use for Lea "Cubi-Meters."

The Lea Recorder Company, Ltd., of 28, Deansgate, Manchester, has published a pamphlet describing the adoption of their "Cubi-Meters" for loading coal to locomotive tenders. The particular plant is situated at the engine sheds at Kipps, on the line between Glasgow and Edinburgh. It is electrically-operated, and has been designed and constructed by Messrs. Henry Lees & Co., Ltd., Glasgow, to the requirements of Mr. H. N. Gresley, C.B.E., Chief Mechanical Engineer to the London and North-Eastern Railway Company. When a locomotive is to be coaled no attendance is required on the plant. The engine driver has only to place his engine in position, and set in motion an electric motor. The required amount of coal is then rapidly delivered, being, at the same time, automatically measured and registered under the particular engine number concerned. The apparatus is set to deliver coal at the rate of 1½ tons per minute, with the result that the largest express locomotive tender could be filled in little over 3 minutes.

Contracts Open.

Coal.

The Wilmslow and Alderley Edge Gas Company invite tenders for the supply of coal. [See advert. on p. 320.]

The Wigan Corporation Gas Department invite tenders for the supply of coal. [See advert. on p. 320.]

Dehydration and Naphthalene Plant.

The Gas Committee of the Borough of Ilkeston invite tenders for the supply and erection of a dehydration and naphthalene extraction plant. [See advert. on p. 320.]

Sulphate of Ammonia Plant.

The Gas Committee of the Borough of Ilkeston invite tenders for the supply and erection of a sulphate of ammonia plant. [See advert. on p. 320.]

Coal Markets.

The coal markets show no improvement in general, and the cumulative effect of several months of bad trade is being seriously felt. There is still no disposition on the part of consumers to operate except from hand to mouth, and forward inquiry is negligible. Abnormal stocks are held everywhere on the Continent after the exceptionally mild winter, so that the summer situation is very different from that of last year. Besides this, buyers are likely to await the full effect of the coal legislation before committing themselves.

On the North-East Coast, coking coals have been moderately firm at low prices, but there is very little doing in gas coals, and quotations are easier if anything. Wear specials are nominally 16s. 6d. f.o.b., and best qualities 15s. 9d., while seconds and others ask 13s. 6d. to 13s. 9d. The situation in Northumberland is such that collieries have found it necessary to revise the minimum price at which sales may be made, and best screened sorts are at 13s. 6d. f.o.b., which compares with a market value of 16s. f.o.b. at the beginning of the year. There is talk of some minimum price action being taken in Durham also, but here, owing to the many kinds and qualities, it is not such an easy matter.

In all the other districts the markets are quiet, and easy both for home and export trade. The official export price for Yorkshire screened gas remains at 15s. 9d. to 16s. 6d., but there is very poor demand.

Gas coke is reported as a better market than in recent weeks, supplies being none too plentiful. The price remains, however, round 21s. 6d. to 22s.

Current Sales of Gas Products.

The London Market for Tar, Tar Products, and Sulphate.

London, *May 5.*

To-day's prices of tar products are as follows:

Creosote for export is 6d. to 6¼d. per gallon f.o.b.

Pitch is 47s. 6d. per ton f.o.b.

Pure toluole is 2s. 3d. to 2s. 4d.; solvent naphtha, 95/160, about 1s. 5d.; pure benzole, about 1s. 11d.; and pyridine bases, 3s. 9d.—all per gallon.

Tar Products in the Provinces.

May 5.

The average prices of gas-works products during the week were: Gas-works tar, 21s. to 26s. Pitch—East Coast, 46s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 46s. f.o.b.* Toluole, naked, North, 1s. 7¼d. to 1s. 8¼d. Coal-tar crude naphtha, in bulk, North, 9d. to 10d. Solvent naphtha, naked, North, 1s. 3d. to 1s. 3½d. Heavy naphtha, North, 1s. to 1s. 0½d. Creosote, in bulk, North, liquid and salty, 3½d. to 3¾d.; low gravity, 1¼d. to 1½d.; Scotland, 3½d. to 3¾d. Heavy oils, in bulk, North, 5½d. to 6d. Carbolic acid, 60's, 2s. 4d. to 2s. 5d. prompt. Naphthalene, £12 to £14. Salts, £5 to £5 10s., bags included. Anthracene, "A" quality, 2½d. per minimum, 40 p.ct., purely nominal; "B" quality, unsaleable.

* It is proposed in future to quote all prices for pitch on the basis of f.o.b. In order to arrive at the f.a.s. value at any port, it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

Glasgow, *May 3.*

There is still very little business being transacted, and prices generally are easy. No marked improvement is noticeable in refined tars, although by the middle of the month large quantities should be required.

Pitch.—The nominal prices remain unchanged at 47s. 6d. to 50s. per ton f.a.s. Glasgow for export, and about 50s. per ton *ex* works for home trade.

Tar.—Quotations are still being made on the basis of 3¼d. to 3⅜d. per gallon f.o.r. makers' works in buyers' packages.

Creosote continues very quiet. B.E.S.A. specification is 3½d. to 4d. per gallon; low gravity, 3d. to 3½d. per gallon; neutral oil, 3d. to 3½d. per gallon—all f.o.r. works.

Cresylic is easier in tone, but meantime prices are unaltered. Pale 97/99 p.ct. is 1s. 8¾d. to 1s. 9¾d. per gallon; dark 97/99 p.ct., 1s. 7¼d. to 1s. 8¼d. per gallon; pale 99/100 p.ct., 1s. 11¼d. to 2s. 0¼d. per gallon—all naked at works.

Crude naphtha is quoted at 4¾d. to 5¼d. per gallon in buyers' tank wagons at makers' works.

Solvent Naphtha.—Orders are very scarce, and prices are easy at 1s. 2½d. to 1s. 3½d. per gallon for 90/160 grade, and 1s. to 1s. 1d. per gallon for 90/190 grade.

Motor benzole is, if anything, better, and value may be taken at 1s. 6½d. to 1s. 6¾d. per gallon free on rails.

Pyridines are inactive; 90/160 quality being about 3s. 3d. to 3s. 6d. per gallon.

Benzole Prices.

The following are considered to be the market prices at the present time:

	s. d.	s. d.	
Crude benzole . . .	0 10 to	0 11	per gallon at works
Motor ,, . . .	1 5½ ,,	1 6½	,, ,, ,,
Pure ,, . . .	1 10 ,,	1 11	,, ,, ,,

Topical Items.

Amalgamation of Gas Undertakings—Compensation for Loss of Employment.

The following scheme providing for compensation for loss of employment due to amalgamations of gas undertakings has received the approval of the National Joint Industrial Council for the Gas Industry.

(1) Where an amalgamation (as hereinafter defined) between two or more undertakings has taken place compensation (as hereinafter determined) shall be payable by the purchasing undertaking to any gasworker who—

(*a*) has been in the continuous service (as hereinafter defined) of one of the amalgamating undertakings for a period of three or more years immediately preceding the amalgamation;

and

(*b*) has in consequence of such amalgamation suffered loss of employment or diminution of wages, otherwise than on grounds of misconduct, incapacity, or superannuation, provided that the claim of such gasworker is made within a period of five years from the date of the amalgamation.

(2) (*a*) The compensation payable in cases where a gasworker has suffered loss of employment shall be a total sum of money payable by weekly instalments or otherwise as hereinafter mentioned and calculated in accordance with the following scale:

(i.) Men of or over 50 years of age—2 weeks' pay (as hereinafter defined) for each year of service.

(ii.) Men of or over 45 years of age, but under 50 years of age—1½ weeks' pay (as hereinafter defined) for each year of service.

(iii.) Men under 45 years of age—1 week's pay (as hereinafter defined) for each year of service.

(iv.) The above compensation shall be paid by weekly instalments, except in special cases, when an application may be made for a lump sum payment, and if the undertaking declines to make a lump sum payment then the decision shall rest with the National Joint Industrial Council.

(v.) The amount of the weekly instalment to be agreed with the beneficiary of the gas undertaking concerned, but to be at the rate of not less than 10s. per week.

(vi.) In the event of the death of the beneficiary prior to the payment of the full amount to which he is entitled under the scheme, the balance outstanding to be paid to his "dependants" (as defined by the Workmen's Compensation Acts).

(*b*) Where a gasworker has suffered diminution of wages (otherwise than on grounds of misconduct, incapacity, or superannuation) compensation shall be payable on the above-mentioned scale, but the loss suffered by such gasworker shall be deemed in such case to be his "week's pay."

For example, if a stoker earning (say) 70s. per week was employed (after and in consequence of an amalgamation of gas undertakings) as a labourer earning 50s. per week, his loss would be £1 per week, and this sum (viz., £1) would be deemed to be his "week's pay" for the purposes of compensation under this scheme, so that if the gasworker were 55 years of age and had 30 years' continuous service he would receive the sum of £60.

(3) Where a gasworker is entitled—otherwise than under this scheme—to receive from the undertaking in whose service he has been any sum or sums of money by way of compensation for loss of employment, such sum or sums shall be deducted from the compensation receivable under this scheme.

(4) If any gasworker refuses an offer of work within the undertaking for which he is suitable, he shall be deemed for the purposes of this scheme not to have suffered any loss of employment.

(5) The following phrases in this document contained bear and are intended to bear for the purposes of this scheme the meaning set out hereunder:

(i.) "Amalgamation" means and includes cases where:

(*a*) The gas undertakings of existing undertakers are transferred to a new company incorporated for the purpose of such amalgamation;

or

(*b*) one or more undertakings are absorbed by another undertaker.

(ii.) Continuous service includes service in any of His Majesty's Forces during the Great War.

(iii.) Week's pay means the sum payable in respect of a normal working week at plain time rates, inclusive of war wage advances.

(6) Any difference of opinion which may arise with regard to the interpretation of this agreement shall be settled by the National Joint Industrial Council for the Gas Industry, whose decision shall be final and binding upon the parties concerned.

Amalgamation of East Surrey and Croydon Gas Companies.

An extraordinary general meeting of the East Surrey Gas Company will be held on May 23, for the purpose of approving the necessary draft Order respecting the proposed amalgamation of the undertaking with that of the Croydon Gas Company. The proposed terms are as follows:

Holders of East Surrey 6 p.ct. cumulative preference stock, for every £100 of such stock will receive £120 of 5 p.ct. perpetual debenture stock in the amalgamated Company.

Holders of East Surrey 5½ p.ct. "A" preference stock, for every £100 of such stock will receive £100 of 5½ p.ct. preference stock in the amalgamated Company.

Holders of East Surrey "B" ordinary stock (upon which a dividend of 5½ p.ct. was paid for 1929), for every £100 of such stock will receive £30 of maximum dividend (5 p.ct.) stock and £70 of sliding-scale stock (at present paying 7 p.ct. per annum) in the amalgamated Company.

Holders of East Surrey 4 p.ct. debenture stock, for every £100 of such stock will receive £80 of 5 p.ct. perpetual debenture stock in the amalgamated Company.

Holders of East Surrey 5 p.ct. debenture stock, for every £100 of such stock will receive £100 5 p.ct. perpetual debenture stock in the amalgamated Company.

The East Surrey 7½ p.ct. debenture stock redeemable at par on July 1, 1931, will be taken over by the amalgamated Company.

Provision has been made for the representation of the holders of stocks in this Company on the Directorate of the amalgamated undertaking, the title of which will be "The Croydon and East Surrey Gas Company."

The retiring Directors, Auditors, and officers will be compensated by the Croydon Company as is usual.

From the consumers' point of view, it is stated, the terms will effect an immediate reduction in the price of gas.

Teachers' Training Course in Gas Subjects.

The Secretary of the Institution of Gas Engineers announces that arrangements have been made by the Board of Education for a Training Course for Teachers of Gas Engineering and Gas Supply at Westminster Training College from July 21 to 25 inclusive. The work will consist of teaching practice, blackboard drawing, special lectures on subjects of interest to those engaged in the distribution of gas, and visits to works.

Applications to attend the course should be made immediately to the Secretary, Board of Education, London, S.W. 1.

The Board of Education pay third-class return railway fare to all teachers accepted for the course. Accommodation is provided at the Westminster Training College on application to the Principal, at a charge of £2 10s. for the week. In order to be able to start on Monday morning, teachers are required to assemble at the College on Saturday evening.

National Gas Council and Federation of Gas Employers.

In lieu of the usual monthly meetings of the Central Executive Board of the National Gas Council held on the second Tuesday of the month, the meeting for this month will take place on Tuesday, May 27, at 12 noon, and will be held at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 2.

The same applies in regard to the Central Committee of the Federation of Gas Employers, the time of the meeting being 11 a.m. on the same day.

These meetings will be followed by the annual meetings of the Federation of Gas Employers and the National Gas Council, at the Incorporated Accountants' Hall, at 2.15 p.m. and 2.45 p.m. respectively.

The usual monthly meeting of the Central Executive Board will not be held during the month of June.

Imperial Continental Gas Association.

The Board of the Imperial Continental Gas Association have resolved that, subject to the approval of the proprietors, a final ordinary dividend on the £1,976,000 old capital stock be paid on May 23 next, for the period ended March 31, to proprietors registered on May 8, 1930, at the rate of 12½ p.ct. (actual), *less* income tax, making with the interim dividend of 5 p.ct. (actual), *less* income tax, paid on Nov. 27, 1929, a dividend of 17½ p.ct.

The general meeting will be held in Winchester House, E.C. 2, at 2.30 p.m., on Wednesday, May 21.

The Two-Part Tariff in Operation.

In spite of the depression in trade, and short time in the local factories, which have reduced the consumption of gas for industrial purposes, the volume of gas sold by the Halifax Gas Department during the year ended March 31 last was 920 million c.ft. compared with 905 million c.ft. in the previous year.

Eighty p.ct. of the gas consumed during the past year has been sold either under the two-part scale or the block system; and the flat rate, which now affects only a small proportion of the gas supplied, has been reduced by 3d. per 1000 c.ft. during the course of the year.

Some time ago the Halifax Gas Committee decided to discontinue the system of charging a higher price in the out-districts, and the 6d. difference between the Out-of-Borough and the Borough rates has been reduced in three stages, and in two years' time the price will be the same throughout the whole area of supply.

Many of the domestic users who were formerly small customers are now consuming so much gas that their average all-in price is 2s. 6d. and less per 1000 c.ft., or, roundly, 25 p.ct. above pre-war. In the industrial field the all-in rates, as the result of the two-part tariff, are in fact below the level of pre-war rates.

The Local Authority adopted a three-part tariff for public lighting five years ago, and as a result there has been a substantial increase in the volume of gas used for public lighting, because the addition of one or two mantles to a lamp only increases the commodity charge. Many lamps which a few years ago had only one mantle have now two or three mantles, and all the Class A roads are lighted by 6-mantle cluster lamps.

Last year the gross profit was £58,521, or 15'20d. per 1000 c.ft. of gas sold, and the surplus, after meeting all dues and demands, was £15,757, or 4'09d. per 1000 c.ft. of gas sold.

Leeds' Plan for Meeting Last Year's Deficiency.

The "Yorkshire Post" for May 3 announces that in an endeavour to recoup themselves for losses sustained during the past financial year, the Leeds Corporation Gas Department are proposing to impose meter rents throughout the city.

A resolution to this effect will come before the City Council to-day with a recommendation that the change take effect from July 1. The Department are also recommending the Council to reduce the price of gas by 0'42d. per therm, the equivalent of 2d. per 1000 c.ft., as from the meter reading in June next.

The rents suggested for meters are as follows:

Size of Meters.	Rent per Annum. £ s. d.	Size of Meters.	Rent per Annum. £ s. d.
3, 5, and 10	0 8 8	300 and 400	7 14 0
20	0 10 6	500 and 600	12 0 0
30	0 17 6	1000	14 0 0
50 and 60	1 2 0	N1, N2, N3	0 8 8
80	1 10 0	N4	0 10 6
100	2 0 0	N5	0 17 6
150	3 5 0	Automatic meters	0 8 8
200 and 250	4 8 0		

In the course of an interview Mr. Eric Clark, Chairman of the Gas Committee, said the Committee felt that merely to increase the price of gas to meet the deficiency would have resulted in the loss of a number of industrial consumers, which, in turn, would have penalized the ordinary remunerative consumers of gas. Then, the cost of street lighting would have gone up by over £2500, a bill which the ratepayers as a whole would have had to foot. More important still, the loss of consumers through an increase in the price of gas might have necessitated a further increase at some future date.

The Committee felt that by introducing meter rents such contingencies would not arise, but that it would be possible to reduce the price of gas still further at no very distant date. At the moment there are about 90,000 users of gas in the city who come under the heading of non-remunerative consumers, for the reason that they do not use sufficient gas to give the undertaking any return for services rendered. By making such people pay small meter rents it is hoped to make them into remunerative consumers without at the same time penalizing the existing remunerative consumers.

Primitiva Gas Company of Buenos Aires.

At the Twenty-Ninth Annual General Meeting of the Primitiva Gas Company of Beunos Aires, Ltd., held at Winchester House, E.C., on Tuesday, April 29, the Acting Chairman (Col. Le Roy-Lewis, C.B., C.M.G., D.S.O.) moved that the Directors' report and accounts for the year ended Dec. 31, 1929, be received and adopted, and that a dividend of 1s. 3d. per share be declared and paid on the ordinary shares of the Company.

In the course of his remarks, Col. Le Roy-Lewis said that the Chairman, Mr. P. Ashley Cooper, was away on the Continent at this time on business connected with the Company, and in his absence he had been asked to take the chair at this meeting. The task was not a heavy one, as, in view of the important fact that all but 5 p.ct. of their old shareholders had exchanged their shares for shares in Primitiva Holdings Ltd., the Chairman preferred to make his usual informative speech on the operation of the Company to the shareholders of the Holdings Company. Suffice it to say that the year 1929 had proved a successful one and the operations of the year had enabled the Board to place £25,000 to contingencies reserve, £75,000 to depreciation and renewals account, to recommend a dividend of 1s. 3d. per share requiring £145,286, and to carry forward £58,040 to 1930.

Before asking Mr. Frank H. Jones to second the resolution, the Chairman invited questions; but none being asked, the resolution was put to the meeting and duly carried.

Mr. P. Ashley Cooper, Viscount St. Davids, and Mr. Maurice Bock (the latter representing the Cia. Hispano Americana de Electricidad) were re-elected Directors, and the Auditors—Messrs. George A. Touche & Co.—were re-appointed.

Wales and Monmouthshire Juniors at Pontypridd.

The Annual General Meeting of the Wales and Monmouthshire Junior Gas Association was held at Pontypridd on Saturday, April 26. Prior to the meeting, the members assembled at the Old Gas Yard, and were invited by Mr. David Muir, the Engineer and Manager, to inspect the spirally-guided gasholder which is being erected and is now nearing completion.

Later, in the Council Chamber, the meeting was presided over by Mr. W. E. Crowley, the President. A warm welcome was accorded to Mr. J. H. Canning, O.B.E., Engineer and Manager to the Newport Gas Company.

Mr. Canning, in thanking the members for their welcome, gave an interesting survey of the Wales and Monmouthshire District Institution of Gas Engineers and Managers.

The Hon. Secretary (Mr. H. S. Bartlett) presented the eighth annual report, on behalf of the Council, for the session 1929-30. This was adopted. The report showed a net increase of six in membership of the Association. "A special word of praise to the Editor of the 'Gas Journal,'" it is stated, "would perhaps not be out of place here for the publication of our monthly meetings, including the authors' papers and the discussion matter. It is quite safe to assume that we shall as an Association occupy a much larger space in the Transactions about to be issued than in any previous year."

It is mentioned that arrangements are already well in hand for the summer visit. By the courtesy of Dr. Charles Carpenter, C.B.E., President of the South Metropolitan Gas Company, facilities are afforded to members to visit their East Greenwich Works. The date provisionally fixed for this visit is Thursday, July 3.

The Hon. Treasurer submitted the statement of accounts, which showed a balance in hand of 10s. 11d. This was also approved and adopted.

New Officers.

Following this, the election of officers for the ensuing session was proceeded with. The unopposed returns were as follows:

President, Mr. C. H. Collins, Swansea.

Senior Vice-President, Mr. S. E. Brett, Rhondda.

Hon. Secretary, Mr. H. S. Bartlett, Cardiff.

Hon. Treasurer, Mr. B. J. Bell, Cardiff.

Council, Messrs. A. E. Martin (Merthyr), T. Noall (Cardiff), W. T. Lane (Cardiff), and E. E. Moore (Swansea).

For the office of Junior Vice-President, Mr. C. S. Thane was elected. Four nominations had been received for two vacancies on the Council, and the ballot resulted in Messrs. H. D. Hazell (Newport) and T. H. Madden (Cardiff) being elected.

Mr. W. T. Lane (Cardiff) was duly elected Hon. Librarian, and Messrs. J. Hislop (Newport) and T. Smith (Cardiff) were re-elected Hon. Auditors.

The proceedings terminated with a vote of thanks to the retiring President, Mr. W. E. Crowley, for his untiring efforts on behalf of the Association. This was proposed by Mr. T. Noall (Cardiff) and seconded by Mr. B. J. Bell (Cardiff).

New System of Collecting at Barnet.

The Barnet Gas and Water Company have introduced a system of collecting their accounts from consumers which is intended to abolish the method of sending collectors from door to door.

The new system, which is already being used by a few undertakings, provides for collection of accounts through a local bank. Each demand note contains a perforated counterfoil bearing a stamped receipt, which the recipient may hand to any branch of the Westminster Bank with the amount. The bank detaches the receipt, and after completing it, hands it back to the consumer. The other part of the demand note is then returned to the Company with an intimation that the amount has been credited to their account.

Midland Juniors Visit Coventry.

Following a paper by Mr. J. H. Willis on the "M.A.N. Waterless Gasholder"—see later pages of this issue of the "JOURNAL"—members of the Midland Junior Gas Association paid a visit to the gas-works of the Coventry Corporation on Saturday, April 26, their main object being to see the "M.A.N." holder now in course of construction by Messrs. Clayton, Son, & Co., Ltd. At the present time the holder is in its most interesting stage, the piston and the roof having just been completed. It is readily accessible for inspection.

The members were received by the Chairman of the Gas Committee (Mr. H. H. Cheshire), who was supported by the Vice-Chairman (Councillor G. E. Roberts), Alderman W. H. Batchelor, Mr. P. N. Langford (Engineer), and Mr. C. F. Tooby (Assistant Engineer).

At the conclusion of the inspection, tea was provided in the Sports Pavilion. Mr. A. R. Myhill (President of the Association) proposed a vote of thanks to the Committee and Staff, which was ably seconded by Mr. W. McNaughton (Wolverhampton).

At the invitation of the Engineer, a number of the party afterwards took the opportunity of seeing the many up-to-date features of the gas-works.

Popular Hospital Savings—The Gasworkers' Point of View.

According to figures just published, more than 86 p.ct. of the gas-workers in South London are members of the Hospital Saving Association. The benefits obtained are found to be so valuable that the membership is steadily increasing among all classes of workers.

As the result of making small weekly contributions, nearly 8000 employees of the South Metropolitan Gas Company, as well as their wives, children, and other dependants, are provided with full medical and dental treatment when required. The South Metropolitan Gas Company's group, which has now 7799 contributors, is one of the largest subscribing units in the country. Every month between four and five hundred vouchers are issued to members, who are thus able to obtain the very best treatment at little or no cost to themselves beyond their regular contributions. In addition, dental letters are issued, and dental surgeons visit the employees weekly at the depôts where they are employed. In this way treatment and supplies, valued at several hundred pounds, are provided each month.

At the Thames Street station all employees are members of the Association. At the Old Kent Road depôt there are 2846 contributors, with a further 1966 members at the East Greenwich works.

"The great merit of the Hospital Saving Association," said an official to a correspondent last week, "is that it has applied the principle of insurance to the needs of hospitals and hospital patients to their common advantage. The various hospitals co-operating with the Association are assured of a more regular income, and contributors are relieved of much anxiety.

The benefits to which a member is entitled may be divided into two groups—"hospital" and "extra-hospital." Hospitals are either co-operating or non-co-operating. When treatment is required at a hospital which is co-operating with the Association, a member of a group obtains a green voucher and presents it at the hospital. In the case of non-co-operating hospitals, the member attends the hospital, receives his treatment, and makes his payments as a private patient. The receipts he obtains are sent in, and a refund of the amount is made by the Association.

Among the "extra-hospital" benefits, the provision of which, it must be remembered, is not the main purpose of the Association, are dental, surgical, ambulance, optical, and convalescent home benefits, and the method of obtaining assistance with these benefits varies.

"B.C.G.A." Nineteenth Annual General Meeting and Conference at Hull and Bridlington.

Oct. 27 to 29.

The Nineteenth Annual General Meeting and Conference of the Association will be held on Oct. 27 to 29 next (inclusive), under the Presidency of Mr. Henry Woodall, M.Inst.C.E. The full programme for the meeting is in course of preparation, and will be circulated to members as soon as it is completed.

VENUE OF THE CONFERENCE.

Because of the inadequacy of suitable hotel accommodation in Hull, it has been necessary to arrange for the residential quarters of the conference to be located in Bridlington; and it is proposed to divide the business proceedings of the programme between Hull and Bridlington—the Tuesday in Bridlington, and the Wednesday in Hull.

VISIT TO THE WORKS OF THE BRITISH GAS LIGHT COMPANY.

The President and Directors of the British Gas Light Company, Ltd., have kindly arranged for an official visit to the Company's works at Sculcoates, Hull, and this will follow immediately after the luncheon on Wednesday, Oct. 29.

Haywards Heath District Gas Company.

The Directors' report on the past year's working of the Haywards Heath District Gas Company, submitted at the annual meeting by the Chairman (Mr. Edward C. Charleton), showed that the balance to the credit of the profit and loss account amounted to £6994. The dividend on the 6½ p.ct. redeemable preference stock for the half-year ended Dec. 31 last was £650, and the final dividend at the rate of £9 10s. p.ct. per annum on the 5 p.ct. consolidated stock for the half-year ended Dec. 31 last, making £8 10s. p.ct., *less* income-tax, for the year, was £1741, making a total of £2391, and leaving a balance to be carried forward of £4602. The sales of gas showed an increase of 9·3 p.ct. for the year as compared with 1928. During the past year the high-pressure main had been extended to Handcross, and other important improvements and extensions had been effected.

Moving the adoption of the report, statements of accounts, and balance-sheet, the Chairman said the total make of gas for the year was over 130 million c.ft.—an increase of nearly 13 million c.ft., or rather over 10 p.ct. The price of 11·4d. per therm, which was now being charged, compared favourably with charges of neighbouring gas companies. The total quantity of gas sold was 115,750,000 c.ft.—an increase of nearly 10 million c.ft., or over 9 p.ct. The Company's showroom on the Broadway had again proved its use, the increase of sales of various articles exceeding that of 1928 by nearly 50 p.ct. In addition they had added nearly 150 new consumers to the list of customers. With regard to residual products, the sale of coke had been satisfactory.

Notes from Scotland.

Reconstruction at Johnstone.

The sum of £12,000 is to be borrowed by the Johnstone Town Council for the reconstruction of their gas-works.

Cookery Exhibition at Ayr.

An exhibition of gas ovens and cookery demonstrations have been given in the Town Hall, Ayr, preliminary to the Scottish District Conference of the British Commercial Gas Association, which was held in Ayr on Friday, May 2. Dr. Brown, Medical Officer, Ayr, who opened the exhibition, said that in working-class homes meals were much too hurriedly prepared, and though there was some excuse for this in the old type of house, there was none to-day for those who lived in the modern type of house provided by the local authorities, where there were ample facilities for cooking and turning out a varied meal. The chief defect of British cooking was the attempt to cook too rapidly.

Newburgh Gas-Light Company to be a Limited Liability Concern.

A special meeting of the shareholders of the Newburgh Gas-Light Company was held in the Offices of the Company on Saturday, April 26—Provost Anderson presiding.

The meeting was convened for the purpose of considering a resolution of the Directors that the Company should be converted from an unlimited Company to a limited one, and that the shares should be transferred from £5 each to five shares of £1 each, with the same capital—namely, £1800.

The resolution was moved from the Chair, Mr. D. M. Adamson seconding, and was carried unanimously. The Secretary (Mr. James M'Kinlay) stated that all the shareholders were represented, with the exception of two, and a total of 1725 shares were submitted in favour of the resolution.

Developments at South Cave Sand Quarries.

The Lord Mayor of Hull (Councillor Richard Richardson) performed a most interesting ceremony on the morning of Friday, May 2, when he opened the new plant erected at the South Cave Moulding Sand Quarries, in which Messrs. General Refractories Ltd., of Sheffield, and Messrs. The Yorkshire Amalgamated Products Ltd., of Doncaster, are jointly interested.

One of the most modern plants in the country for the milling, mixing, and disintegrating of sand has been installed, and to Councillor Richardson belongs the distinction of first setting in motion the installation, the sand produced from which will, it is believed, prove of service to the foundries of Hull in particular and of Yorkshire and the neighbouring counties generally. Many grades and mixtures of varying strength can be prepared. There are two excellent deposits of sand—one a strong bonded loam and the other a silica sand—which can be mixed to any consistency required and to suit any foundry.

Sand as quarried is milled and disintegrated and then loaded into trucks, the whole operation being automatic after the placing of the sand itself in the mill. Several grades are produced, and a feature is that the sand can be guaranteed to be absolutely regular and reliable without fear of those disturbing variations of quality which are so great a source of trouble to foundrymen. After the sand has been carefully selected and mixed, it is well milled, and conveyed in buckets on a mechanized elevator to a chute, whence it is deposited direct into the truck. The sand, which belongs to the Upper Jurassic beds, has a face 40 ft. in depth and covers thirty acres.

After the opening ceremony lunch was served at the Royal Station Hotel, Hull, Mr. F. Metcalfe Fisher in the chair. The toast of "The City and Trade of Hull" was given by Mr. Frank Russell, F.G.S., and responded to by the Lord Mayor; "The Foundry Industry" was proposed by Mr. F. G. Foster, and on behalf of the industry Mr. Fenton replied. "The Allied Firms" (Messrs. General Refractories, Ltd., and Yorkshire Amalgamated Products, Ltd.) was put by Mr. F. Metcalfe Fisher, to which Mr. Thomas Singleton responded.

This new enterprise will be of inestimable benefit to founders. It shows that the refractories industry is fully alive to, and anxious to help with, the problems of the foundry, and the works at South Cave are an excellent and notable example of how genuinely first-class moulding sands can be produced.

Views of "Housewives-to-be" on the Gas Switch.

In connection with a Gas Exhibition recently held at Wigton, the Wigton Gas Company offered prizes for essays by school children on "What interested me most at the Exhibition, and why."

A particularly noticeable feature of the results of this competition was that the first and second prizes for elementary school girls over 12 years of age, and the first prize for girls under 12 years of age, went to entrants who wrote about the "Newbridge" positive gas switch.

The views of these "housewives of the future" were very interesting and showed that the entrants fully appreciated the economy and labour-saving value of this gas lighting device. "This invention," wrote one girl, "saves time, matches, and patience;" while another said: "The gas switch lights up a room in a second, with no fumbling about in the dark for matches. . . . A gas switch for economy will soon be a familiar phrase." A third entrant (a girl of 12 years old) also noticed that "people can switch on two lights from one point or one light from two points."

It is pleasing to note that this further asset to gas lighting is being made known, and its reliability and simplicity more fully realized; for where the children have noticed these things it goes without saying that their parents have probably been favourably impressed by the devices also. As one of the entrants to the competition said, "If the inhabitants of Wigton"—and, after all, the name of any other town can equally well be substituted—"get their new Council houses well provided throughout with gas, Wigton will be sure to grow into a fine working town."

Views of the Mere Male.

The points which seemed to appeal most to the male entrants were in connection with the display of chemicals and bye-products obtained from coal, though a few remarked upon the gas refrigerator and the demonstration meter. Some of the boys showed a remarkable grasp of the bye-products produced in a gas-works, while others referred to the ease of cooking by gas. One of the entrants struck the right note when he concluded: "Gas is very much cheaper than electricity, and very much better."

The Wigton Gas Company presented a total of sixteen prizes to elementary and secondary school children, and all the prize-winning essays were published in the "Wigton Advertiser," which shows that gas is a live interest in the town and fully appreciated by the inhabitants.

Gas at a Newcastle Trader's Exhibition.

Gas plays a prominent part in the "Kitchencraft Exhibition" which is being held at Messrs. Fenwick, Ltd., of Newcastle.

There is an ideal kitchen, sitting-room, and bathroom, all with the most sensible ideas to offer. The kitchen, it is stated, is a triumph of science. It is equipped with an all-enamel gas cooker. Gas is utilized to give hot water to the kitchen sink and the bath, to heat irons, and to wash and dry clothes.

Free demonstrations in gas cookery featuring many new dishes are being given twice daily during the Kitchencraft Exhibition. They take place at 11.15 a.m. and 2.45 p.m., except on Saturdays, when morning sessions only are held.

The cookery demonstrators are Miss Freda Wood, L.C.A., and Miss Dorothy Harle. These experts are engaged by the Newcastle-upon-Tyne and Gateshead Gas Company, who have installed the many attractive gas appliances that are an important part of the new kitchen movement.

The kitchen equipment includes a storage water heater, gas heated and thermostatically controlled; this modern appliance is attracting much attention.

Gas in the Barnsley Council Houses.

Views of the National Gas Council.

In connection with the recent trouble at Barnsley in regard to the installing of gas by the Gas Company in 181 houses on the Carlton Lane Estate, when a Sub-Committee recommended the ejection of the whole of the tenants of the houses where gas had been installed, dealt with in the "Journal" for April 16 last, the following letter appeared in the "Yorkshire Post" for May 1, from Mr. W. J. Smith, Secretary of the National Gas Council:

In the interests of its members, of the Barnsley Gas Company, of the gas industry, and of the public in general, the National Gas Council is naturally following with close attention the situation which has arisen between the Barnsley Town Council (who supply electricity to the town) and certain of their tenants who, because they have installed gas in the Council houses which they occupy, are threatened with eviction unless the gas installations are removed.

Fortunately the Town Council have referred back to the Housing Committee which put it forward, the proposal that a policy of eviction should be adopted, and it is sincerely to be hoped that, as has happened in a considerable number of similar cases which have occurred elsewhere, wiser counsels will prevail. In these circumstances it is not the intention of the National Gas Council to make any comment upon the pernicious nature of the principle which underlies the Committee's proposal, more particularly as that aspect of the matter was admirably dealt with in your editorial of the 10th inst. ["Yorkshire Post" for April 10] headed "Black Barnsley and its Tenants." The Council desires, however, in view of statements which appear to have been made when the Town Council discussed the matter, to point out that in making the installations to which the Housing Committee object, the Barnsley Gas Company, so far from being guilty of trespass, were merely carrying out an obligation laid upon them by Act of Parliament—viz.,

> The undertakers shall, upon being required so to do by the owner or occupier of any premises situate within 25 yards from any main of the undertakers, or such other distance as may be prescribed, give and continue to give a supply of gas for such premises, under such pressure in the main as may be prescribed, and they shall furnish and lay any pipe that may be necessary for such purpose,

and that they would have been liable to penalties had they failed to do so.

It should also be pointed out that the National Joint Industrial Council for the Gas Industry, which consists of an equal number of representatives of the organizations representing employers and employees in the industry, last year denounced the policy at present being followed by the Barnsley Town Council in the following terms:

> This Council views with concern the fact that in certain cases local authorities by inserting conditions in leases and in other ways have interfered with the liberty of choice of their tenants in determining what forms of light, heat, and power they will use in their houses, and considers that all tenants of Council houses should be free to use whatever form of lighting, heating, &c., they may desire.

This dragooning of tenants under threat of eviction savours of feudalism, and is unworthy of any local authority.

The leader in the "Yorkshire Post" of April 10, to which Mr. Smith refers, stated that municipal interference in the affairs of private traders is often carried outrageously far, but a more preposterous attempt than this to restrain personal liberty of choice has seldom been perpetrated. After outlining the details of the situation, the writer went on to say that a

couple of centuries ago Barnsley carried the title "Black Barnsley." It has dropped the adjective without greatly improving the conditions which made its neighbours consider it appropriate. One could imagine a council of idealists, appalled, as Ruskin was, by the smoke-cloud which overhangs the place, energizing itself to persuade its citizens to abandon the burning of raw coal, and such a body might, with excuse, manifest a little impatience towards those who, against the amenities of the place, persisted in making smoke. But there is no such idealism or zealous care of the amenities of Barnsley about the Socialist majority of the Council, for their prohibition is uttered against the smokeless fuel—gas. In many a working man's home where meals—breakfast especially—have to be prepared in a hurry, an alternative for the kitchen fire is almost necessary. It is evident, however, that the Council believes that a municipally managed electricity works cannot compete on fair and even terms with a privately managed gas-works in providing this service. It may be perfectly right in this lack of confidence in its own management of a public service, but that distrust is surely no adequate reason for denying its tenants their choice of services.

Manufacture of Gas-Making Plant Filmed.

An interesting film has been taken at the works of Messrs. W. C. Holmes & Co., Ltd., Turnbridge, Huddersfield, featuring the gas-making plant as manufactured by the firm.

The kinema is now being increasingly employed by industry, not just for advertisement but for instructional purposes. Messrs. Holmes, for example, have made the largest gas-meter in the world at the establishment in which they are interested at Chesterfield. [A photograph of this meter, it will be remembered, appeared in the "JOURNAL" last week.] This monster meter is going out to Australia, but it has to be transhipped in sections. The assembling of these sections is not easy, and to help the Australian engineers a film of the assembling of the meter will be sent along with it.

The main purposes of the present film are to show the scope of the work undertaken by the firm, something of its history, and some details of technical interest. Messrs. W. C. Holmes & Co., Ltd., have been intimately associated with the development of the gas industry for eighty years. They are manufacturers of all kinds of gas-making plant, and the founder of the firm was a pioneer in establishing gas-works, promoting gas-works, and putting in gas plant in about 200 townships in this country. He laid down plant in many towns abroad as well, in places so widely apart as Siam, the Japanese Mint, Russia, Spain, and Germany.

To-day the firm is making bye-product plant, coke ovens, and plant required in low-temperature carbonization as well, and the film is largely concerned in this aspect of their activities. The letterpress is to be translated into several languages, and copies will be sent abroad for the use of engineering societies.

The picture, which was shown at the Grand Theatre, Huddersfield last week, was attended by most of the Huddersfield workpeople.

South African Lighting Association Dividend.—At a meeting of the Directors of the South African Lighting Association, Ltd., held on April 24 in London, it was resolved to recommend the payment of a dividend for the year 1929 of 5 p.ct., subject to income-tax at 2s. 6d. in the £, such dividend to be payable on May 29.

Tenders for East Hull Stock Issue.—The tenders for the new issue of £20,920 5 p.ct. redeemable debenture stock which were offered by Messrs. A. & W. Richards, of 37, Walbrook, E.C. 4, on behalf of the Directors of the East Hull Gas Company, were opened on April 29, the issue being over-subscribed at prices ranging from £103 per £100 down to the minimum of par.

Exhibition of Appliances at Darwen.—An exhibition of modern gas appliances was opened at the Darwen Co-operative Hall, on April 29, by the Mayor (Councillor A. Duckworth, J.P.). Alderman George Pickup, J.P., Chairman of the Gas Committee, emphasized that, by using more gas, the public would help to cure the smoke evil and bring down the price of gas. The Mayor said he believed well-cooked food resulted in greater happiness in the home.

North of England Gas Managers' Association (Auxiliary Section).—The twentieth half-yearly meeting of the North of England Gas Managers' Association (Auxiliary Section) will be held in the Recreation Room at the Water Works of the Hartlepool Gas and Water Company, Middleton Road, West Hartlepool, on Saturday, May 24, at 2.30. The chair will be taken by Mr. L. M. Weldon (Distribution Superintendent to the Hartlepool Gas and Water Company), who will deliver his Chairman's Address. After the business of the meeting, an inspection will be made of No. 2 gas-works at Hartlepool, after which tea will be provided at the Water Works.

Electro-Gas Development Company has been registered, with a nominal capital of £1000, as suppliers of electrical and gas heating and cooking apparatus. Offices: 3, Arundel Street, Strand, W.C. 2.

Gas Consumption at Lytham St. Annes.—The gas made in Lytham St. Annes, for the year ended March 31, was 228,997,000 c.ft., the consumption being 9,634,000 c.ft. decrease, attributable to trade depression and mild weather.

Royal Sanitary Institute.—The annual congress of the Institute will be held in Margate during the last week of June, under the Presidency of the Right Hon. Lord Cornwallis, C.B.E., T.D., J.P., D.L., Chairman of the Kent County Council. An exhibition of appliances for the promotion of public health has been arranged, and the exhibits include displays of gas appliances.

New Issue of Capital at Harpenden.—As will be seen from our advertisement columns, an issue by tender is being made by the Directors of the Harpenden District Gas Company, of £15,000 6 p.ct. redeemable preference stock, redeemable at par on June 30, 1955. Prospectuses and forms of tender, the last day for the receipt of which is May 19 next, may be obtained from the Secretary of the Company or from Messrs. Seymour Pierce & Co., of 5, Lothbury, E.C. 2.

Southampton Stock Issue.—The Directors of the Southampton Gas Company, as will be seen from our advertisement columns, are offering for sale by tender £100,000 5½ p.ct. preference stock at a minimum price of issue of £97 10s. per £100 stock. Tenders, forms of which can be obtained from the Secretary of the Company (66, Above Bar Street, Southampton), are invited not later than Monday, May 19, in amounts of not less than £50 stock in multiples of £10.

Gosport Stock Issue.—As will be seen from our advertisement columns, Messrs. A. & W. Richards are offering for sale by tender, on behalf of the Directors of the Gosport District Gas Company, £10,000 consolidated ordinary stock, ranking for a standard dividend of 6 p.ct.; also £3800 6 p.ct. redeemable debenture stock, to be redeemed at par on Jan. 1, 1940. The minimum of stock which may be tendered for, or will be allotted, is £50. Above this, tenders may be in multiples of £1. Tenders must be received not later than 11 o'clock on Tuesday, May 13.

Manchester Technology Research Scholarships.—The Governing Body of the Manchester Municipal College of Technology offers a limited number of Scholarships of a value not exceeding £100 a year, which will be open to part-time students in the College of Technology, and others who are Manchester ratepayers or sons or daughters of Manchester ratepayers. They will be tenable in any one of the University (full-time day) Courses in the Faculty of Technology. Applications must be received on or before June 27, 1930, forms of application and all information being obtainable by written application to the Registrar of the College.

Hong Kong and China Gas Company.—Gas sold in 1929 at Hong Kong decreased by 13 million c.ft. At Kowloon the sales were about the same as previously. A shortage of water in the Colony, also an adverse condition of general trade, are among the reasons why a better year's working is not shown. The returns for 1930 up to date are, however, considerably more satisfactory, and a special intensive canvassing campaign is at present in progress. The Directors recommend a dividend for the year at the rate of 10 p.ct. per annum, *less* income-tax. From this will be deducted the interim dividend of 5 p.ct., paid free of tax on Oct. 17 last.

Harrogate Gas Company's Capital.—In order to comply with the requirements of the Stock Exchange Committee, particulars are published of the Harrogate Gas Company. The authorized capital is £382,071. There has been issued £161,480 of consolidated stock at a premium of £35,966, as well as £35,840 of 4 p.ct. preference stock at a premium of £1539, and £42,250 of 6 p.ct. preference stock at a discount of £2250. The consolidated stock carries a maximum dividend of 10 p.ct., which has been paid regularly since the stock was consolidated in 1922. The total loan capital raised is £101,898, including premiums, *less* discount. It is now proposed to issue £46,940 of 5 p.ct. debenture stock, out of the proceeds of which £500 of 4 p.ct. debenture stock and £9000 of 5 p.ct. mortgages will be redeemed.

Manchester District Institution of Gas Engineers.—The May meeting of the Institution will be held at the Midland Hotel, Manchester, on Friday, May 16, at 3 p.m., under the Chairmanship of Mr. W. J. Smith, B.Sc., of Bolton. The Committee have invited Mr. H. C. Widlake, A.M.I.E.E., Electrical Engineer to the Plymouth Gas Company, to speak on this occasion, and he will discuss points in connection with the question of damage to gas pipes by fusion and electrolytic action. The speaker will give practical demonstrations with a working model of two houses connected to a 12-volt accumulator, and so wired as to permit of a demonstration of any fault or combination of faults which would result in a short circuit current flowing to earth via either the legitimate earthing connection or through the gas meter and service pipe.

National Smoke Abatement Society.

Public Conference in London.

A public conference arranged by the National Smoke Abatement Society was held at 71, Eccleston Square, Westminster, S.W. 1, on Friday, May 2, with a view to discussing an important section of the 1926 Public Health (Smoke Abatement) Act, which has not yet been taken up by the local authorities. This was the first conference of the newly formed Society to be held in London, and Dr. H. A. Des Vœux occupied the chair.

Provisions were made in the Act under discussion for the making of by-laws which would require new buildings to adopt "such arrangements for heating or cooking as are calculated to prevent or reduce the emission of smoke." This does not apply to private dwelling-houses, but includes, of course, shops, office buildings, warehouses, restaurants, hotels, and theatres. The reason that local authorities have not made use of these powers is that much difficulty has been experienced in the framing of a suitable by-law, and the purpose of this conference was to discuss the difficulties that have been met with, and, if possible, to arrive at a satisfactory formula.

Paper by Mr. C. J. Allpass.

The discussion was opened by Mr. C. J. Allpass, Chairman of the Greater London Regional Smoke Abatement Committee, and of the Public Control Committee, London County Council, who dealt in detail with the by-laws under section 5 of the Public Health (Smoke Abatement) Act, 1926. Although the main issue was not of vital concern to the gas industry as a whole, the following extracts may be of interest.

Section 5 of the Act reads as follows:

> The powers of an urban authority under section 157 of the Public Health Act, 1875, and of the London County Council under section 164 of the London Building Act, 1894, shall extend to the making of by-laws requiring the provision in new buildings other than private dwelling-houses of such arrangements for heating or cooking as are calculated to prevent or reduce the emission of smoke.

It is a matter, said Mr. Allpass, of considerable satisfaction to those who realize to what a large extent the domestic chimney contributes to the output of smoke, that, in the majority of new dwellings, the old fashioned type of "kitchener" has given way to the gas cooker or, to a lesser degree, to the electric cooker, and that the number of open grates for the combustion of bituminous coal has been enormously reduced. And this has been done with due regard to economy and convenience, and by many people it will be considered a fair argument to suggest that what has been done voluntarily by the many who have been engaged in erecting new dwellings should in due course be a matter of compulsion for the remainder, wherever the conditions permit of this being done.

It has been suggested on the one hand that the open grate should be abolished, and on the other hand that a tax should be imposed upon the use of raw coal. But it is exceedingly doubtful whether public opinion would support such drastic measures, and it may be stated without hesitation that although the open grate, no matter what the type, is not a thoroughly efficient appliance in which to burn raw coal, it has certain well-known advantages in the matter of ventilation, and in cheering us up in the dark days of winter. The most practical solution at the present time appears to be the provision of a smokeless solid fuel which can be sold at a reasonably competitive price and which will give the pleasing effects associated with the coal fire. Meanwhile I am confident that if the practice of mixing coke with raw coal were more largely adopted by householders, their open fires would be equally pleasing and no less effective, and the quantity of smoke emitted would be considerably reduced.

Notes for Architects on Smoke Abatement.

When designing public buildings such as town halls, libraries, schools, &c., the local authority should see that suitable provision is made for preventing or reducing to a minimum the emission of smoke.

Where, as will frequently be the case, the whole building is warmed by means of a central heating apparatus, the matter of smoke abatement will be simple; whether the medium adopted be hot water, steam, or warm air, the main consideration in reference to smoke abatement will be to use smokeless fuel such as coke or anthracite in the heater or boiler. There may, however, be parts of a building or rooms which, on account of their purpose or the limited occasions of their use, cannot conveniently depend upon a central heating apparatus. In such cases some other provision must be made, and the alternatives are (1) the use of gas for heating; (2) the use of electricity; (3) the use of smokeless fuel, or (4) the use of apparatus which is adapted to burn coal with the least necessary smoke.

With gas the chief consideration is to provide proper flues or other suitable outlets for the products of combustion, which, though not visible, may none the less be dangerous to health if allowed to escape into a room inadequately ventilated.

When fixing open grates intended to burn coke, attention to the following points will tend to ensure success. If there is little flame to heat up the air entering the chimney flue, that flue should have a good draught. The distance from the top of the fire to the canopy should be rather less than for coal fires, and the fire should not project too far forward to cause risk of any of the products of combustion escaping into the room. The column of fuel should be deep and be well insulated with firebrick except where exposed to view in front. Grooves on ridges in the firebricks to allow air to pass are useful, and means to regulate the draught both below the fire and above it are desirable.

In conclusion, Mr. Allpass considered that if the practice of mixing coke with raw coal was more largely adopted by householders, their open fires would be equally pleasing and no less effective, and the quantity of smoke emitted would be considerably reduced. The powers conferred upon local authorities by section 5 of the Act were too limited in scope, particularly with regard to the County of London, to permit by-laws of real value being made, and the decision of the Minister of Health as to their purport further restricted their sphere of usefulness.

The Chairman, at the conclusion of Mr. Allpass's remarks, thanked the speaker for his very able exposition of the points at issue, and said that they had now got to decide what they were to do in the matter. He would be glad if anyone could suggest a way in which Parliament could correct their errors of the past.

Faulty Gas Fire Flues.

In the course of the discussion which followed, Mr. Clark said that he had found types of flue brick in use in houses on certain L.C.C. estates, which, he affirmed, were quite unsuitable and even dangerous. A lady from Hampstead was of opinion that it was a good idea to burn both gas and coal simultaneously in a grate in order to lessen the emission of smoke.

Mr. Robinson (Bristol) explained that they at Bristol had submitted some draft by-laws to the Ministry of Health, but the majority of them had been ignored.

This question was discussed at some length.

Bailie Munro said that at Glasgow all gas fires and boilers had to be passed by the Gas Department before they were fixed on premises. They sent out an inspector who took a chimney draught test of the products from the appliances.

The main trend of the discussion went towards pointing out that the Ministry of Health was adopting a wrong attitude in the matter, while it was also thought that local authorities were remiss in not facing the problem as they should and making suggestions to the Ministry.

Mr. Harris (Paddington) stated that he was of opinion that if the Society had an attractive programme to assist authorities out of their difficulties, a series of by-laws might be more readily framed.

The Resolutions.

It was finally decided that the following resolutions should be adopted, on the proposition of Sir Lawrence Chubb (Advisory Secretary), seconded by Mr. Graham:

(1) That the attention of the Minister of Health be drawn to the limitations imposed under section 5 of the Act of 1926, and that he be requested to take the necessary steps to enable local authorities to obtain a legal decision upon the scope of by-laws permissible under the Act, and that, if further necessary, he should secure Parliamentary authority for the extension of such powers at the earliest possible date.

(2) That the Ministry of Health should be asked to issue model by-laws under the section for the guidance of those concerned.

(3) That this Society urges local authorities to formulate and send to the Minister of Health by-laws for his approval.

(4) That this Society should secure the co-operation of the Royal Institute of British Architects and the Institution of Civil Engineers in the investigation of the best means of securing that in all new buildings furnaces and fireplaces are constructed so as to prevent the smoke arising from the combustibles used therein.

A vote of thanks to the Chairman passed on the proposition of Mr. Allpass concluded the conference.

North of England Gas Managers' Association.

Annual Meeting in Newcastle.

The Annual General Meeting of the North of England Gas Managers' Association was held in the County Hotel, Newcastle, on Friday afternoon, May 2, when the PRESIDENT, Mr. C. F. Blincoe, took the chair.

The minutes of the last meeting were, by general consent, taken as read.

LOSS BY DEATH.

The PRESIDENT said that it was a painful duty to announce the loss by death of five members since the last meeting. They mourned the loss of Mr. E. Shaul; Mr. G. Pettigrew; Mr. W. Siddle; Mr. Norman S. Cox, late Hon. Secretary and Treasurer, of Sunderland; and Dr. W. B. Davidson, of Newcastle.

Of the latter two, Mr. Blincoe made special mention. The death of Mr. Cox, he said, had come with tragic suddenness, and even yet they had hardly realized the gap which had been made in their ranks by his loss. Kindly at heart, unselfish in his devotion of time and energy to his duties as Secretary and Treasurer, he was a man whom the Association could ill afford to lose.

Dr. Davidson was a man of high accomplishments in the world of science, and the gas industry had benefited by the work which he had done. When he had addressed the Association, his quiet, modest manner had always commanded attention and won admiration.

As a mark of esteem and deep regret at the loss of the above members, the President asked the assembly to rise.

The PRESIDENT congratulated Dr. J. T. Dunn, the Newcastle City Analyst, upon his election to the Presidency of the Society of Public Analysts, and hoped that his period of office would be an entirely successful one.

The statement of accounts revealed the satisfactory position of the financial affairs, the balance of income over expenditure for the year amounting to £66 9s. 11d.

NEW MEMBERS.

The PRESIDENT placed before the assembly the names of applications which had been recommended for election to membership and associate membership. These were: Member, Mr. Harry Forrest, Gas Office, Spennymoor. Transfer to membership; Mr. John Corrigan, Gas-Works, Penrith; Mr. Thomas C. Whimster, Gas Office, Spennymoor. Associates: Mr. Arthur Coates, Washington Chemical Company; Mr. Terence C. Ellacott, Gas-Works, Bishop Auckland; Mr. James Richardson, Hendon Gas-Works, Sunderland; Mr. J. F. Lord, Darlington; and Mr. C. A. Howarth, Newcastle.

A short résumé of the work that had been done by local students who had attended classes during the past session at Rutherford College, Newcastle, under the Institution of Gas Engineers Education Scheme, was given by Mr. C. D. DRURY, of Sunderland, Chairman of the District Council. A successful session's work had been done, but Mr. Drury said he urged that heads of gas undertakings should see that as many students as possible came forward for next session's course. He stressed the point that as many young men as could possibly attend should do so. The classes were a great help.

Mr. A. E. Ruffhead, Assoc.M.Inst.C.E., the President-Elect of the Association, was elected the representative on the Council of the Institution of Gas Engineers. Mr. Ruffhead is the Engineer and Manager of the Darlington Corporation Gas Department, a position he has held since 1920. Prior to his appointment at Darlington, he was for nine years with Messrs. T. F. C. Hawkesley, Consulting Engineers; and he has also been with the Sunderland Gas Company and at Burton-on-Trent. He was educated at King's College, London.

The recommendation of the Committee, that a donation of £10 10s. be contributed to the Benevolent Fund of the Institution of Gas Engineers, was adopted.

CONTROL OF VERTICAL RETORTS.

The PRESIDENT then called upon Mr. H. B. Kendrick, of Conway, and late of Carlisle, to give his paper on "The Control of Vertical Retorts." This will be found on later pages of the "JOURNAL" to-day.

EXTENSIONS TO PURIFIERS AT MIDDLESBROUGH.

Following the discussion on Mr. Kendrick's Paper, Mr. J. W. PALLISTER, of Middlesbrough, read a paper entitled "Extensions to the Purifying Plant at Middlesbrough." This also is published on later pages of this issue.

Mr. W. TUNMORE proposed a vote of thanks to the authors of the papers, which was seconded by Mr. L. M. WELDON, and heartily accorded.

NEW OFFICERS.

The following officers were formally elected:

President.—Mr. A. E. Ruffhead, Darlington.

Vice-President.—Mr. J. R. Bradshaw, Hartlepool Gas and Water Company.

Committee.—Messrs. H. Lees, Hexham; W. Tunmore, Bishop Auckland; A. Pickering, South Shields (Hon. Secretary and Treasurer); H. D. Lees, Hexham; and C. H. Armstrong, Newcastle (Auditor).

The PRESIDENT paid a tribute to Mr. C. F. Barrow, of Sunderland, for the very able help which he had given in organizing the meeting and carrying on the duties of Secretary.

Upon his retirement as President, Mr. Blincoe was presented with a Presidential Certificate by Mr. Ruffhead, the new President.

Accepting the office of President, Mr. RUFFHEAD said that he was conscious of his limitations, but thanked them for having conferred the honour upon him. He referred to the place of the next meeting, and asked them to visit Darlington. It was decided to leave this in the hands of the Committee, but that the next meeting would probably be held on the first Friday in October, at Darlington.

The meeting concluded with a vote of thanks to the President, Committee, and Auditor for their services during the year, which was proposed by Mr. RUFFHEAD and seconded by Mr. A. PICKERING.

Low-Temperature Carbonization.

Report of Test on the "Babcock" Plant.*

Reviewed by "TAMBT."

The combination of the carbonization process with steam raising for electricity generation is one of those practical dreams which, sooner or later, must be made to come true. There appear to be several ways of realizing such a dream. In the gas industry we should prefer to apply gas itself to the steam raising duty. In the "Babcock" process now installed at Dunston (Newcastle-upon-Tyne) the coke is applied to this duty, together with some 26/27 therms (38,000 c.ft.) of gas per ton of coal at the very low calorific value of 70 B.Th.U. per cubic foot. The amount of tar made is about 16 gallons *plus* 2½ gallons of spirit scrubbed from the gas—that is to say, not very different from what would be realized in any of the standard carbonizing plants.

The carbonizing plant tested by the Fuel Research Station staff consists of two retorts each of 30 tons capacity (one of which was isolated for the tests) normally supplying one Babcock & Wilcox boiler. The small coal, normally used, is first dried and preheated by boiler flue gases on a chain grate stoker enclosed in a special setting. From here it is passed into the circular retort where by means of a rotating chute and a system of scrapers a coal bed of about 11 ft. diameter and 3 ft. deep is maintained. The fuel is extracted by means of six horizontal extractor rollers driven individually by hydraulic cylinders. Heating is carried out internally by means of the hot combustion gases from a separate combustion chamber in which either pulverized fuel, producer gas, or coke oven gas may be burned. The temperature of the combustion gases is controlled by the admission of a regulated quantity of steam, and excess of air is admitted to the combustion chamber so that carbonization is assisted by the combustion in the retort of a small portion of the coke. The crude mixture of gases from the retort is passed through coke filters, and the tar and spirit are recovered by condensation and scrubbing according to normal procedure.

Analyzing the solid fuel available, we find that only 65 p.ct.

* Department of Scientific and Industrial Research. Report of test by the Director of Fuel Research on the "Babcock" Low-Temperature Carbonization Plant installed at the Dunston Power Station of the Newcastle-upon-Tyne Electric Supply Company, Ltd. H.M. Stationery Office, Adastral House, Kingsway, London, W.C. 2, 1930; pp. VI. + 30; price, 9d. net.

of the 15 cwt. produced per ton of coal remained on the ¼ in. screen (*i.e.*, about 10 cwt.). It is unfortunate that the test was confined so strictly to the carbonizing plant, because to form any opinion on the economic possibilities of the plant it is necessary to know whether effective use can be made of the whole of the 15 cwt. of solid fuel thus obtained.

The yields of products are neatly tabulated in the summary, but one has to dig out the debit side of the balance from the body of the report. Here we find that for the carbonization process it was necessary to provide gas to the extent of 9·06 therms, equivalent to about 73 lbs. of coke per ton of coal and an addition of 0·28 lb. of steam per lb. of coal, which would take, we suppose, about as much again coke for its production. Roughly, it would appear that the "fuel consumption" was equivalent to 7½ lbs. of coke per 100 lbs. of coal carbonized—a very good performance in view of the very low efficiency of steam as a carbonizing medium.

It is a pity that the commission of the Director of Fuel Research did not allow him to go through with the job and to study the combustion in the boiler furnace. We think that the "gas way" of tackling this problem has still a very good chance. One is forced to the conclusion that as a carbonization process from the point of view of the value of the products, the plant under consideration has very little to recommend it. As an adjunct to the steam raising plant of a power station it is difficult to conceive how the production of some 19 gallons of tar and spirit per ton of coal (particularly at the present value of these products) is to pay for the installation of such a carbonizing system, for the extra labour and supervision entailed, and for the obvious reduction in the fuel value of the coal.

Incidentally, it may be noted that analysis of the tar showed it to be similar to the tars produced from the same type of coal by carbonization in externally heated horizontal retorts at 500°-550° C. With regard to the ammoniacal liquor, some 72 gallons were produced (containing 0·24 p.ct. of ammonia) per ton of coal, and "in practice the liquor is run to waste continuously."

This detailed and lucid report forms a most valuable addition to the growing list of authoritative publications on the performances and capabilities of individual low-temperature carbonization plants.

Western Juniors Visit Weston-super-Mare.

WESTERN JUNIORS AT WESTON-SUPER-MARE.

The Western Junior Gas Association visited the works of the Weston-super-Mare Gaslight Company on April 26, when they were met by two Directors of the Company (Mr. Henry Butt, J.P., and Col. G. Fleming, O.B.E.), the Engineer and Manager (Mr. J. Taylor), and the President of the Association (Mr. J. T. Spencer). The party were conducted on a tour of inspection of the works, and the excellent lay-out of the plant, allowing for future extensions, and the cleanliness prevailing everywhere, were particularly noticed.

Manufacturing Plant.

For the conveyance of coal and other materials used in or produced at the works, a line of railway is laid through the works, and connected with the Great Western system, the length of this siding being over 600 yards. A small locomotive hauls the railway wagons to and from the Great Western Company's premises. All coal used is obtained from the Somerset coalfield.

The retort house is a steel-framed brick building, and contains two benches of horizontal retorts. There are eight settings in each bench, each setting containing eight retorts, 24 in. by 16 in. ⏛ section, 20 ft. in length in the older bench, and 22 ft. long in the other. The retorts are built of silica segments, and are heated by deep regenerator furnaces, which give command of a high range of temperatures with a low consumption of fuel. A Fiddes-Aldridge stoking machine charges the retorts with coal, and simultaneously ejects the coke left from the previous charge. The machine travels on tram rails laid in front of the retort benches, and automatically obtains supplies of coal from the overhead coal hoppers during transit. An older machine of the same make is retained for stand-by purposes. The stoking machines are driven by electricity, produced by the Company's own generating plant.

The red hot coke discharged from the retorts falls into skips, which are hoisted by an electrically-propelled telpher. This machine runs on an overhead track and conveys the coke to the storage yard, stopping to quench it in a quenching tank *en route*.

Engine House.

There are two sets of coal gas exhausters, each of 50,000 c.ft. per hour capacity, and of Donkin's two-blade rotary type, direct-driven by a horizontal steam engine.

An interesting feature is the automatic control of the calorific value of the gas produced, by mechanism which governs the steam supply to the exhausters, working in conjunction with a "Sigma" recording calorimeter. The operation of this instrument results in a considerable reduction in the variations of the quality of gas produced from horizontal retorts. Two "Sigma" calorific value indicators are in use—one on the stream of gas passing to the holders and the other on the gas supply to the town.

The electric generating plant consists of two steam-driven units, one a Newton dynamo of 16½ KW. at 220 volts. D.C., direct driven by a Sissons 26 B.H.P. high-speed engine; and the other is a B.T.H. dynamo of 25 KW. driven by a 39 B.H.P. Sissons engine.

Two Lancashire boilers provide the steam for this portion of the works, and are fired with coke breeze. The feed water is treated by the "Filtrator" system, which has commercial uncrushed linseed as a medium. By this treatment the formation of scale in the boilers is entirely avoided.

A "Nuconomiser" plant, complete with oil separator, is installed for utilizing the heat in the exhaust steam to preheat the feed water supplied to the boilers.

Carburetted Water Gas Plant.

This plant was originally installed in 1905, but has recently been remodelled and now consists of two Humphreys & Glasgow generating sets, each set including the back-run process and forming a complete unit capable of producing 750,000 c.ft. of gas per set per diem. This section is equipped with its own exhausting plant, two Lancashire steam boilers, pumps,

purifiers, meter, relief holder, &c. One steam boiler has recently been replaced, the new boiler being 28 ft. long by 8 ft. diameter with furnaces of the Turbine Furnace Company's type.

The streams of coal gas and carburetted water gas are kept separate throughout the works and are mixed at the inlet of the gas-drying plant.

This plant is of Messrs. W. C. Holmes & Co.'s make and consists of one 8 ft. diameter scrubber-washer in two units of 6 cylinders each, one unit being employed along with the requisite auxiliary cooling and evaporating apparatus for gas drying. The other unit is used for oil washing for naphthalene extraction. A calcium chloride solution is used for the drying process, and ordinary gas oil for naphthalene extraction, the oil being afterwards used in the manufacture of water gas.

COMPRESSORS.

Two compressors are provided for a high-pressure supply to assist in meeting the peak load demands and deliver gas through 6-in. and 4-in. steel mains at 8 lbs. per sq. in. pressure. Duplicate sets of Reynolds' governors are fixed at two positions in the centre of the town and also at a site 1½ miles distant from the works, to supply an outlying district.

The compressors are direct driven by steam engines, one being of Ingersoll Rand make with a capacity of 40,000 c.ft. per hour, and the other of George Waller & Sons' make of 60,000 c.ft. per hour capacity.

The sulphate of ammonia plant is of Biggs, Wall, & Co.'s make, with a Joseph Taylor saturator, and has a capacity of 3 tons of sulphate per diem. It is equipped with the Chemical Engineering Company's drying apparatus. Ammonium carbonate is used for neutralizing, and the sulphate of ammonia produced is perfectly dry, of neutral quality, and contains 21 p.ct. nitrogen.

The tar dehydration plant has a capacity of 12 tons of crude tar per 24 hours. The still is Woodall Duckham Co.'s "T.I.C." type, a lead bath being used for the transmission of heat from the furnace to the tar.

Tar is supplied to conform with the Road Board Specifications, No. 1 or No. 2.

EMPLOYEES' WELFARE, &C.

A co-partnership scheme, under which the employees of the Company are given a bonus on their wages, increasing in amount as the price of gas is reduced, was put into operation in 1909. The scheme was revised in 1922, and a contributory pension scheme was added in 1923. A Committee elected to represent the Directors and the employees, in equal numbers, has the sole management of the schemes. The financial benefits given to the members are considerable, and are greatly appreciated. Of the 199 employees of the Company, 178 are co-partners, and hold stock to the value of £3385.

PRESIDENTIAL ADDRESS.

The visitors were later conveyed to Brown's Café, High Street, where Mr. J. T. Spencer delivered his Presidential Address. [This was published in the "JOURNAL" last week.]

Mr. A. BARRETT proposed, and Mr. T. B. ARMITAGE seconded, a vote of thanks to the President. This was supported by Mr. TAYLOR, who paid a high tribute to the work of Mr. Spencer as his Assistant. The motion was carried with acclamation, and Mr. SPENCER suitably replied.

Tea was provided through the courtesy of the Directors. Mr. B. F. HARRIS proposed, and Mr. G. C. GUNSTON seconded, a vote of thanks to the Directors and staff for the facilities provided for the visit. Mr. H. BUTT and Col. G. FLEMING responded.

ANNUAL GENERAL MEETING.

At the Annual General Meeting which followed, the Chairman, Mr. J. T. Spencer, read apologies for absence. The minutes of the last meeting were read and confirmed. The President stated that the Council had elected Mr. G. C. Gunston (Bristol) as Junior Vice-President for the coming session, to whom a vote of thanks was unanimously accorded for services rendered as Hon. Secretary of the Association since its inception.

The following officers were elected for the coming session:

Hon. Secretary.—W. M. Paterson (Bath).
Hon. Treasurer.—E. Evans (Gloucester).
Hon. Auditors.—F. J. Marlow (Weston) and H. W. Randall (Stroud).
New Council Members.—S. Hole (Bath) and D. L. Copp (Exeter).

The Hon. Secretary's report was taken as read, having been previously circularized, and the Hon. Treasurer's balance-sheet was adopted.

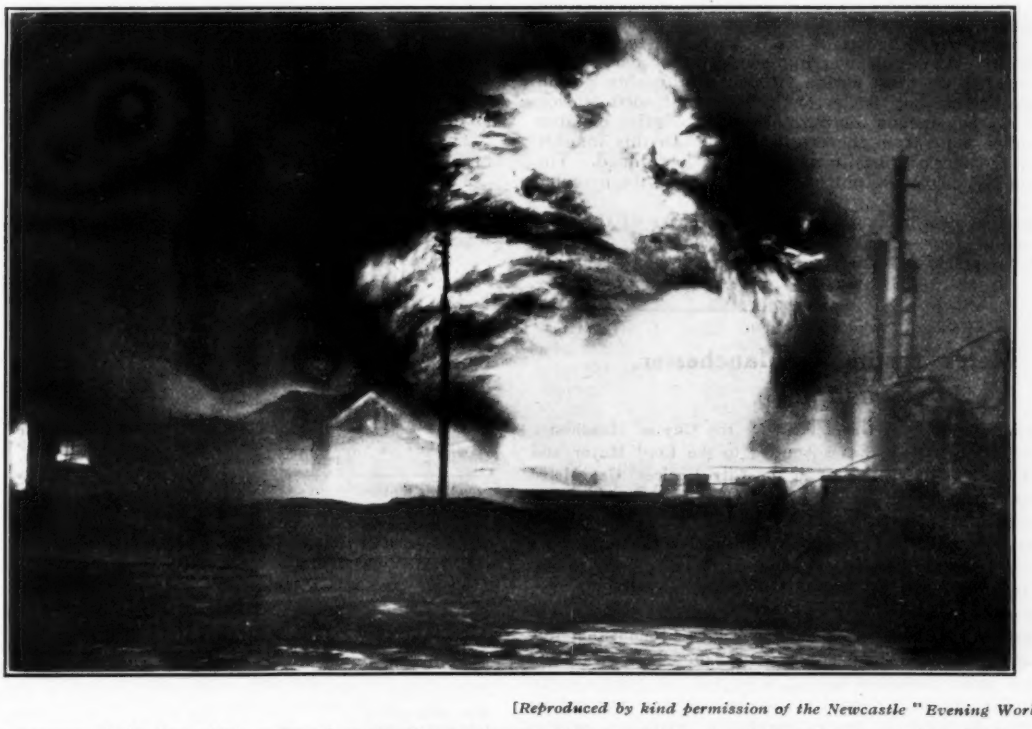
PRIZE SCHEME.

Two prizes given by the Hon. Members for the best papers read during the session were presented by Mr. A. Marsden (Past-President):

1st Prize.—Mr. J. Malsbury.
2nd Prize.—Mr. W. M. Paterson.

The Chairman stated that the Summer Meeting this year would be held at the works of the Plymouth Gas Company on Saturday, June 21.

Fire at Newcastle Gas Company's Bye-Product Works.



[Reproduced by kind permission of the Newcastle "Evening World."

An account of the fire which occurred at the Newcastle-upon-Tyne and Gateshead Gas Company's Bye-Product Works at St. Anthony's appeared in the issue of the "JOURNAL" for April 9 last. The fire broke out at 3 a.m. on April 4. It originated in the base of one of the oil stills; and but for the high south-easterly wind, which carried the blaze over the plant, it would easily have been possible to confine the fire to the still in which the trouble began.

As it was, the damage amounted to about £10,000. Our photograph shows the blaze at its height.

Jeffrey Single-Roll Crusher.

A Machine Specially Designed for Reducing Material to 1¼-In. Cube or Over in One Operation.

The machine illustrated here, which was supplied to a large gas undertaking in the north, is particularly intended to deal with "run-of-mine" or interstratified coal, but is equally suitable for the reduction of such materials as salt, stone, cement, rock, limestone, slag, &c.

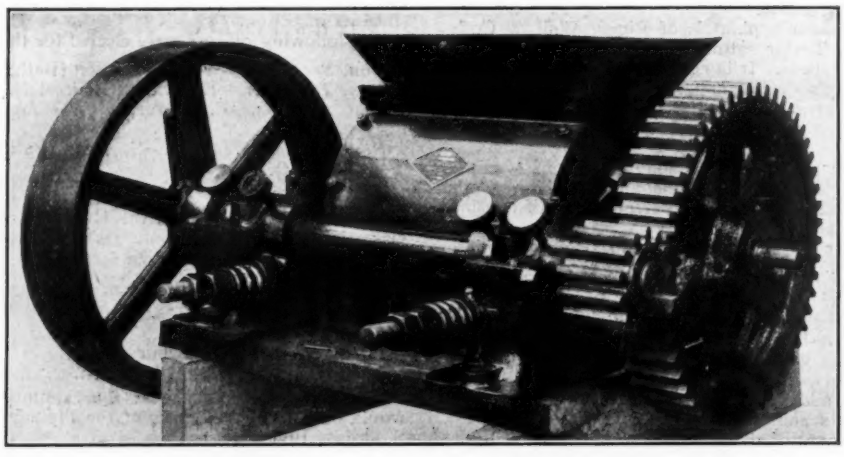
Among the salient features of the machine, mention should be made of the assembly of the large crushing roll and the ease in which any of the roll segments can be taken out or replaced. These segments are made in a special brand of close-grained white iron, a material which experience has shown to have durable wearing qualities, or in manganese steel if specially desired, and are secured to a central cast-iron drum by means of bolts. The provision of hand hole covers, which are situated in the lower part of the machine, allow ready accessibility to this roll.

The crushing teeth are of such a shape effectively to reduce the material under treatment to a consistently uniform size. Each segment is fitted with a row of long feeder teeth which serve to break up the larger size feed before coming into contact with the small teeth. That part of the machine upon which the stock is broken consists of an adjustable breaker plate of massive construction. This is made of steel, and is provided with a renewable wearing shoe at that part of the plate subjected to the most wear. Grooves in this shoe permit the passage of the long feeder teeth. Spring loaded tension rods provide ready means for regulating the relative distance of the breaker plate from the crushing roll. In this manner the size of the stock is easily and quickly determined. The breaker plate is, of course, hinged from the top of the machine frame.

The provision of a heavy flywheel, in the case of the belt-driven machine, ensures perfectly steady running, and the ability of the machine to start up under load is thereby ensured. From this flywheel the drive is transmitted through a heavy shaft and pinion to the machine-cut steel gear wheel, which is mounted directly on the crushing roll shaft. The crushing roll shaft is of massive proportions readily to withstand the severe shocks attendant upon crushing operations. It is mounted on bronze bushings of special composition which are readily renewable. The ample size of these bearings permits the machine to run for long periods without any fear of disturbance, and consequent inefficiency in running due to this occurrence is entirely obviated.

The machine frame is additionally strengthened by the use of two long bolts which run parallel beneath the crushing roll. These rods serve to clamp the side frames and tend to eliminate chatter in the breaker plate.

As a precautionary measure against overload or in the event of an extremely hard foreign material being fed into the machine an efficient shearing pin safety device is arranged. The driving pulley is not keyed to the shaft, but is inserted on a separate hub which it drives through a set of wood pins inserted in holes in the arms of the pulley. When any undue strain comes upon the machine these wood pins shear off, and the roll stops, while the pulley still revolves. By simply inserting new wood pins after the trouble has been removed the machine is ready for further operation.



The matter of lubrication is catered for by the provision of large compression grease cups, which allow of an adequate supply of grease to all working parts. The location of these grease cups will be appreciated from the photograph.

The same machine is also built for self-contained electric motor drive.

The Jeffrey single-roll crusher is a compact and efficient piece of mechanism, and is highly suitable for gas-works installation, where space is frequently very limited. In operation the machine is economical, and maintenance costs are proportionately low.

Meter Testing in Manchester.

Official Report.

The Official Inspector of Gas Meters for the City of Manchester (Mr. Arthur Winterbottom) has submitted to the Lord Mayor and Magistrates of the City the report of the City Justices' Gas Meter Testing Department for the year ended March 31.

The number of meters tested during the year amounted to 78,919, showing an increase of 7109 meters as compared with the previous year. The fees charged amounted to £4542 4s. The sum of £20 16s. has been received from the Police Department for cleaning, &c. £280 was obtained from the sale of old gasholders, and £5 10s. from the sale of old material. Bank interest less commission was £13 19s. 4d.; making a total of £4862 9s. 4d. The expenditure for the same period amounted to £4738 5s. 10d., showing a credit balance of £124 3s. 6d. A total of 3674 meters were rejected, or 4·65 p.ct. Of the total wet meters tested—viz., 2942—141, or 4·79 p.ct., were rejected, and of 75,977 dry meters tested 3533, or 4·65 p.ct., were rejected. The number of prepayment meters tested during the year was 53,059, the remaining 25,860 being meters of the ordinary type.

Table Showing Cause of Error in Meters Rejected at Manchester.

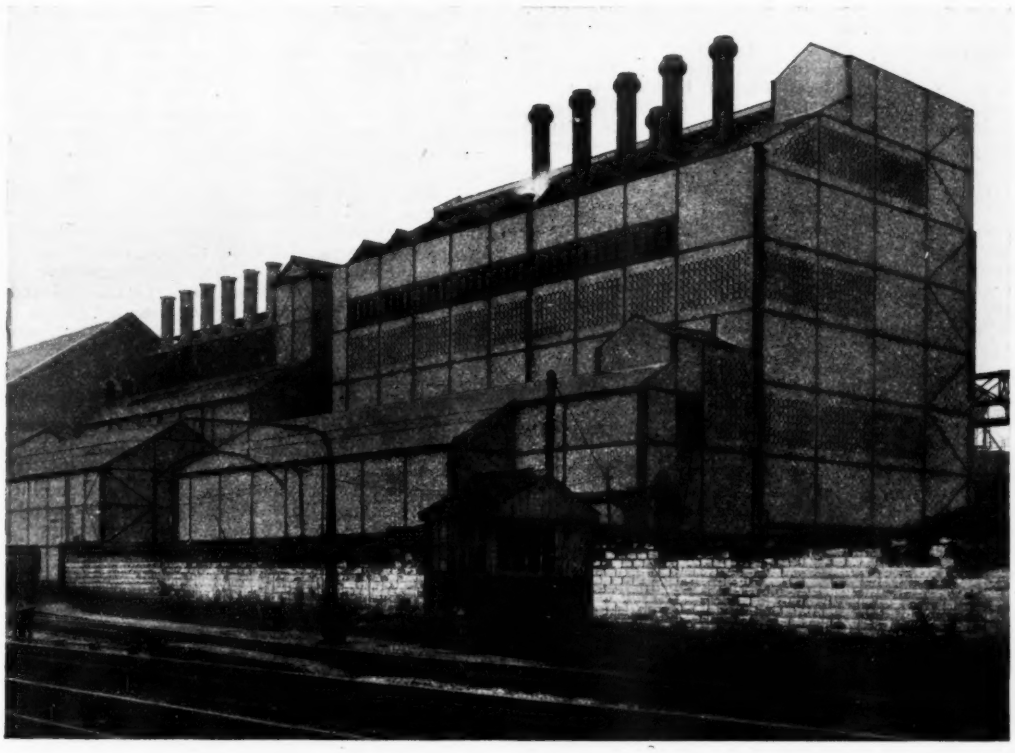
—	Leaking.		More than Two P.Ct. Fast.	More than Three P.Ct. Slow.	Passes Gas Without Registering.	Will not Pass Gas.
	External.	Internal.				
New wet meters	1	2	8	..	..	..
Old wet meters .	33	20	51	..	2	4
New dry meters	32	176	206	149	11	19
Old dry meters .	156	685	831	542	109	58
—	222	883	1096	691	122	81

—	Excessive Absorption of Pressure.	Defective Back Stop.	Other Faults.	Total Rejected.	P.Ct.
New wet meters .	..	..	..	11	1·25
Old wet meters .	5	..	15	130	6·28
New dry meters .	34	131	36	794	1·88
Old dry meters . .	74	150	134	2739	8·07
—	113	281	185	3674	..

XUM

Glover-West Verticals at Lea Bridge.

[From "West's Gas."]



The Lea Bridge District Gas Company supply the districts of Leyton, Walthamstow, and Highams Park, an important residential suburb on the north-east of London and very near Epping Forest. There has been great activity all around London in house building in the last five years, and this district has enjoyed its share. The Company are adding 1500 new consumers each year, and have now 36,000 consumers, and for the year 1929 the make of gas reached the total of 1043 million c.ft.

This continued satisfactory increase necessitated an extension of the carbonizing plant, and in 1929 a new installation (the third) of West's vertical retorts was erected. The plant has been designed for an ultimate output of 4½ million c.ft. per day, but at present only five of the ultimate eight settings, arranged in units of four, have been installed.

The retorts are 40 in. by 10 in. by 25 ft. long with a throughput capacity of 4·7 tons per day as compared with the original installation erected in 1914, where the retorts are 33 in. by 20 ft. long with a capacity of only 2·8 tons per day. This increase of about 70 p.ct. of carbonizing capacity per unit of ground area marks a very considerable and meritorious advance in technique in the last fifteen years. A horizontal fire-tube waste-heat boiler by Messrs. Spencer-Bonecourt has been installed at a high level, so that the flue gases have an upward travel throughout, and sufficient steam is generated at 110 lbs. pressure when the five settings are at work to supply all the steam required on the works, with the exception of the water gas plant, which has also a waste-heat boiler and is practically self-contained.

The coke, when discharged from the retort mouthpieces, is handled by large telpher skips holding nearly a ton.

One of the features of the plant is a 20-ton side discharge wagon tippler supplied by Messrs. Henry Lees & Co., and with this tippler the wagon and platform are turned on a pivot about 6 ft. above ground level, and the coal is shot into a hopper arranged at ground level, with the result that there is a considerable saving in first cost, due to not having to build a deep breaker pit in a water-sodden ground near the River Lea.

Handling Plant.

From the receiving hopper the coal is fed by means of a reciprocating feeder into a West single-roll coal breaker, and by means of a cross lip-bucket conveyor it is delivered direct to the retort-house and deposited on a push-plate conveyor, which distributes the coal into the coal bunkers situated above the vertical retort bench. The coal can also be delivered into a steel-framed brick-panelled coal stores off the above lip-bucket conveyor, by way of a band conveyor fitted with a travelling tripper.

With the help of two electric capstans situated near the tippler, 200 tons of coal per day can be handled with ease by one man.

Another feature of the installation is a water-softening plant inside the building, supplied by the Neckar Water Softening Company, in which only soda is used, and the rest of the treatment is assisted by a continuous return device, whereby water is continually returning from the boiler to the softening plant, and the heat obtained from this water completes the treatment, and water of 2° hardness is obtained at very small cost. Along with this new installation several other extensions had to be carried out in 1929, including a new 100-KW. electric generating set driven by a Sissons steam engine to supply the extra current required by all the coal-handling plant in the new house.

Steam Supply.

Also, new water tube condensers and Livesey washers were installed to help the purification.

As an outcome of these improvements, a large steam main has been laid round the works connecting all the plant, and with the aid of steam from the waste-heat boilers in the third vertical retort house and water gas house two small batteries of Lancashire boilers have been shut down, with the consequent saving in fuel and labour cost.

The Lea Bridge Gas Company are very keen on the welfare of their employees, and have provided a very fine sports field and bowling green on the works. Also they have fostered a keen interest in billiards among the men. They are now proposing to build a new institute which will contain recreation rooms and a large concert room. In January last the Company entertained all the employees and their wives to a dinner and social evening, which was a great success.

D. C. C.

Extensions to the Purifying Plant at Middlesbrough.

By John W. Pallister, Assoc.M.Inst.C.E.

[Paper before the North of England Gas Managers' Association.]

Prior to the installation of the new plant, the purifiers at Middlesbrough comprised the following:

(A) Four dry lute purifiers (Nos. 1, 2, 3, and 4), each 40 ft. square by 6 ft. deep, erected in 1900, elevated above ground-level, with overhead revivifying floor. These four boxes are arranged in the form of a square, with Weck centre valve, and contain two tiers of flat grids, the capacity of each box being up to 165 tons of oxide. The oxide is passed through a disintegrator and carried to the overhead revivifying floor by means of a bucket elevator.

(B) Two purifiers (Nos. 5 and 6), each 37 ft. 6 in. by 32 ft. by 5 ft. 6 in. deep, at ground-level, originally erected in 1883 as four water-lute boxes and later converted to two dry-lute boxes. These were used as catch-boxes after the four purifiers described under (A).

(C) Four purifiers (Nos. 7, 8, 9, and 10), each 32 ft. by 16 ft. by 5 ft. 6 in. deep, at ground-level, with revivifying floor above, originally erected in 1893 as water-lute boxes and later converted to dry-lutes.

These provided two independent units, necessary in view of the fact that at times two or three different kinds of gas have to be dealt with—*i.e.*, coke oven gas, coal gas, and carburetted water gas. Items (B) and (C) had seen their useful life, and it was necessary to demolish these completely and to erect a new and modern plant to take the place of the second unit; a larger plant was also required, as the maximum daily output had increased to 4½ million c.ft. No hesitation was felt in deciding to construct the new plant of the elevated type with overhead revivifying floor, partly owing to the economy in working of the existing elevated boxes as compared with those at ground-level, but chiefly owing to the limited space available; in fact, on the latter account elevated boxes were essential. The question of yard area is frequently a serious matter on a gas-works, and a point to remember when comparing the capital cost of purifiers at ground level with that of elevated boxes and revivifying floor, is that the latter arrangement gives two additional floor areas for the storing and handling of oxide, &c., and the value of this additional land should be offset against the cost of boxes at ground level. The area thus saved with the new purifiers at Middlesbrough amounts to 2500 sq. yards; land recently purchased for other purposes adjacent to the works cost £1 per sq. yard.

The only position available for the erection of the new purifiers was on the site of a range of existing buildings, partly occupied by the catch-boxes Nos. 5 and 6. The adaptation of this congested site was by no means an easy problem, being bounded on one side by the buildings of a neighbouring engineering works, and on the other side by existing buildings of our own. After careful measuring-up it was found that the maximum width of boxes which could be accommodated was 40 ft., which, with the connections alongside, made the new building 49 ft. 10 in. in width over-all. The site was certainly utilized to the best advantage, as the new building "fits like a glove," even the eaves-gutters of the existing buildings having to be removed to make way for the side columns of the new structure. Preparation of the site was begun in January, 1929, by the demolition of the existing buildings upon it, part of which consisted of the two catch-boxes Nos. 5 and 6; and from the time when these were put out of action for breaking up until the first of the new boxes was completed, boxes Nos. 7, 8, 9, and 10 were used as catch-boxes by raising all eight valves of the Weck centre valve, thus putting the four boxes in parallel as one.

Foundations.

The demolition of the catch-boxes left this portion of the site 7 ft. below ground-level. The remainder of the site consisted of loose filled-in ground, but good firm clay was found at an average depth of 8 ft. The loads on the foundations are as follows:

—	Side Columns.	Centre Columns.
	Tons.	Tons.
Maximum load from column	74·26	43·57
Weight of concrete in foundation	6·70	7·59
Total load on ground	80·96	51·16
Size of foundation	8 ft. by 4 ft.	4 ft. 6 in. square

The pressure upon the ground was thus 2·53 tons per sq. ft.

Three of the side columns came in line with a brick wall which, being a party wall, could not be removed. These three columns were therefore made shorter and carried upon a steel joist grillage resting upon the wall, suitably designed so as to transmit the column loads to the wall within safe bearing limits for brickwork, it having been also ascertained that the footings of the wall gave sufficient area to transmit the load to the ground. In another case a column occurred over an existing 24-in. main, and a steel joist grillage was employed to span over the main to concrete foundations on either side. Another column was situated in way of the spindle of an existing 24-in. valve, necessitating closing down for a few hours while the valve was turned over to the other side so as to be clear of the column foundation. Owing to the side columns being so close to the walls of the existing buildings, these walls had to be underpinned and strutted while the foundations were being put in. One of the station meter houses towards one end of the site came in the way of the side columns, but the station meter houses had to be re-constructed in any case to make provision for two new meters of the "Connersville" type, one of which has now been installed. The foundations were all made 1 in. below finished level, to allow for packing-up and levelling of the columns, and afterwards grouted in. The mixture used for the concrete was in the proportion of 4 c.ft. of whinstone chippings, size 1½ in. to ⅛ in. mesh, 2 c.ft. of sand, and 90 lbs. or 1 c.ft. of Portland cement, a large machine mixer of ⅔ cub. yard capacity being used.

Purifiers and Structure.

The tender of Messrs. Ashmore, Benson, Pease, & Co., Ltd., of Stockton-on-Tees, was accepted by the Gas Committee for the supply and erection, to the designs and specifications of the Gas Department, of the cast-iron purifiers, steel substructure and building, and conveying and elevating plant. The purifiers are constructed in one line divided into six boxes with division plates, as follows:

(i.) One box, 40 ft. by 30 ft. by 6 ft. deep inside, to serve as a catch-box for the existing purifiers Nos. 1, 2, 3, and 4.

(ii.) Four boxes, each 40 ft. square by 6 ft. deep inside.

(iii.) One box, 40 ft. by 30 ft. by 6 ft. deep inside, to serve as a catch-box for (ii.).

The structure consists of three floors—ground floor, purifier floor, and revivifying floor—also a footway in the roof principles alongside the conveyor, with staircases for access at each end of the building. The height of the purifier deck level and of the revivifying floor level above the ground have been made to coincide with those dimensions of the existing house, from which the brick gable has been removed so as to make the floors of both houses continuous. The bottom plates are 5 ft. square by ⅜ in. thick, side plates 6 ft. 4 in. by 5 ft. by ⅜ in. thick, division plates 6 ft. 4 in. by 5 ft. by ⅜ in. thick, and deck plates ¾ in. thick. All flanges are 3½ in. wide by ⅞ in. thick, with cored holes for ¾-in. bolts 6 in. pitch. Four openings, each 14 ft. by 16 ft. 3 in., are formed in the deck plates in each box for the steel covers, which are constructed of ⅜-in. steel plate, 5½ in. by 3½ in. by ½ in. angle curb, and 4 in. by 2 in. by 7·09 lbs. channel and 3 in. by 2 in. by ¼ in. angle stiffeners.

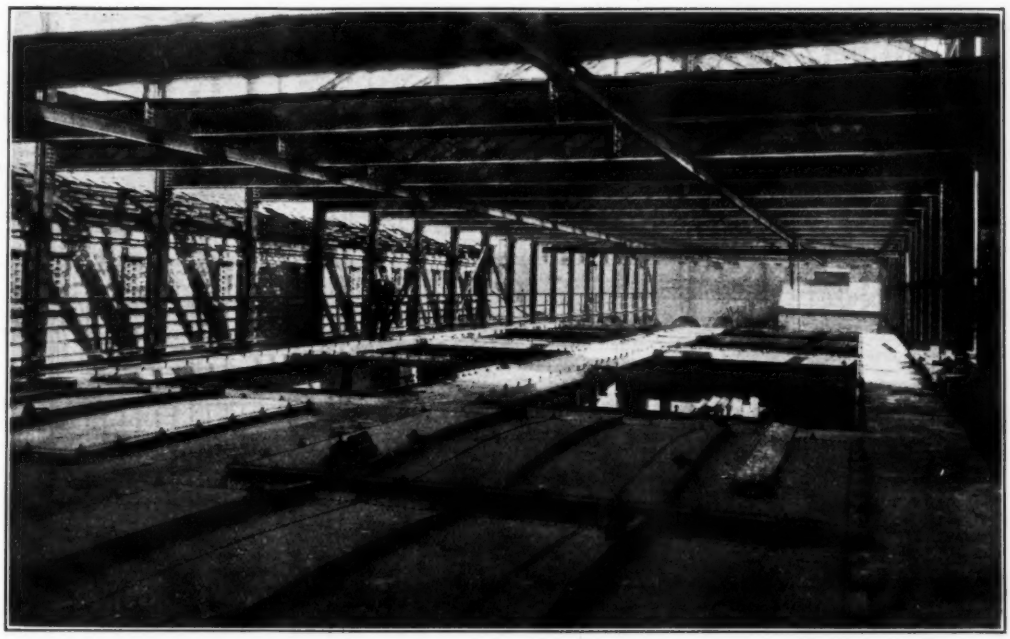
The rubber joint has a steel core and is bolted to the covers, the covers being secured by means of swing bolts. Four 18 in. diameter oxide discharge chutes are provided in the bottom of each box, with self-sealing doors, and from these chutes the 2-in. drains are taken to the seal-pots. Above the oxide chutes 18 in. diameter cast-iron extension pieces are fitted in sections to correspond with the spacing of the grids. The covers are lifted by worm geared lifting and travelling pulley blocks running on 8 in. by 4 in. by 18 lbs. steel joist runways supported from the underside of the revivifying floor beams. The 24 in. diameter connections comprise inlet, outlet, and return mains, and Pickering type valves are fitted to the inlet and outlet of each box, also valves for upward or downward flow. Wood ducts are provided under the bottom tier of grids from the inlet and outlet valve chambers to the opposite side of the boxes, to prevent short-circuiting of the gas direct from inlet to outlet. Two tiers of flat grids are provided, and care was taken in arranging the disposition of the cast-iron standards for supporting the grid bearer bars and deck plates in order to have nearly all the grids of one over-all size, and of as few different shapes as possible. Pressure gauges and thermometers are fitted to every box.

Revivifying Floor.

The revivifying floor is carried by 20 in. by 6½ in. by 65 lbs. steel joists spaced at 10 ft. centres, bolted to the side columns of the building, and suspended at two points in the span by means of steel hangers from the roof principles. This gives a completely clear space to the purifier deck and obviates the difficulties of carrying columns up through the purifiers. By this method, of course, the whole weight of the revivifying floor is carried by the side columns and foundations of the building.

The floor itself was constructed by Mr. H. Turner, of South Bank, and is of reinforced concrete of the continuous slab type,

XUM



VIEW ALONG PURIFIER DECK DURING ERECTION.

and is designed to carry a load of 285 lbs. per sq. ft., exclusive of the weight of the floor itself, equal to a depth of oxide upon the floor of 5 ft. The concrete is 6½ in. thick, reinforced with expanded metal 3 in. mesh, $\frac{5}{16}$ in. by $\frac{3}{16}$ in. strands, placed ½ in. from the bottom of the floor. Over each of the supporting beams, where reversed bending moment occurs in the floor, expanded metal tension strips of the same section and 4 ft. wide are placed ½ in. from the top of the concrete. The timber shuttering for the floor, consisting of 6⅞ in. by 1¼ in. boards, wrought on all faces and edges, was conveniently supported with timber battens between the steel joists, without strutting from the deck below. The mixture used for the concrete was in the proportion of 4 c.ft. of whinstone chippings ¾ in. to $\frac{3}{16}$ in. mesh, 2 c.ft. of sand, and 90 lbs. or 1 c.ft. of Portland cement, machine mixed. Two 10 ft. bays were concreted per day and the shuttering was removed seven days after gauging. Twenty-four steel chutes, 18 in. diameter by 4 ft. long, are fixed in the floor, four over each purifier; and to these flexible canvas chutes are attached when filling a purifier with oxide.

Oxide Handling Plant.

In emptying a box the oxide is shovelled from the purifier through the four discharge chutes to the ground floor below, which is of plain concrete 4 in. thick. The new charge of oxide is then shovelled from the heap already in position over the box on the revivifying floor, through the canvas chutes. This operation of emptying and filling is performed in one day. The discharged oxide is turned over, watered, and fed on to a 16 in. rubber band conveyor, with a belt speed of 157 ft. per minute, running the full length of the building and discharging into the disintegrator. The band conveyor has open sides throughout its length, but is provided with a travelling combined shield and feeding hopper 30 ft. long (see detail fig. 4). This acts as a shield in preventing the edges of the heaps of oxide emptied from the purifier from getting under the conveyor, and also serves as a feed hopper for shovelling into throughout the length of the purifier. The oxide disintegrator is of the fixed type, driven by a 12-H.P. steam engine, and discharges the oxide into the boot of the bucket elevator, which has a speed of 80 ft. per minute. The head of the elevator is provided with a hinged flap which permits of the oxide being—

(1) delivered down a chute through the brick gable of the building into railway trucks in the case of fully spent oxide, or

(2) delivered on to a 16-in. rubber band conveyor 220 ft. long with a belt speed of 157 ft. per minute, carried in the roof principles, with a travelling throw-off carriage for discharging the oxide at any part of the revivifying floor.

VIEW OF REINFORCED CONCRETE REVIVIFYING FLOOR DURING CONSTRUCTION, SHOWING BELT CONVEYOR AND MEMBERS SUSPENDING FLOOR FROM ROOF PRINCIPALS.

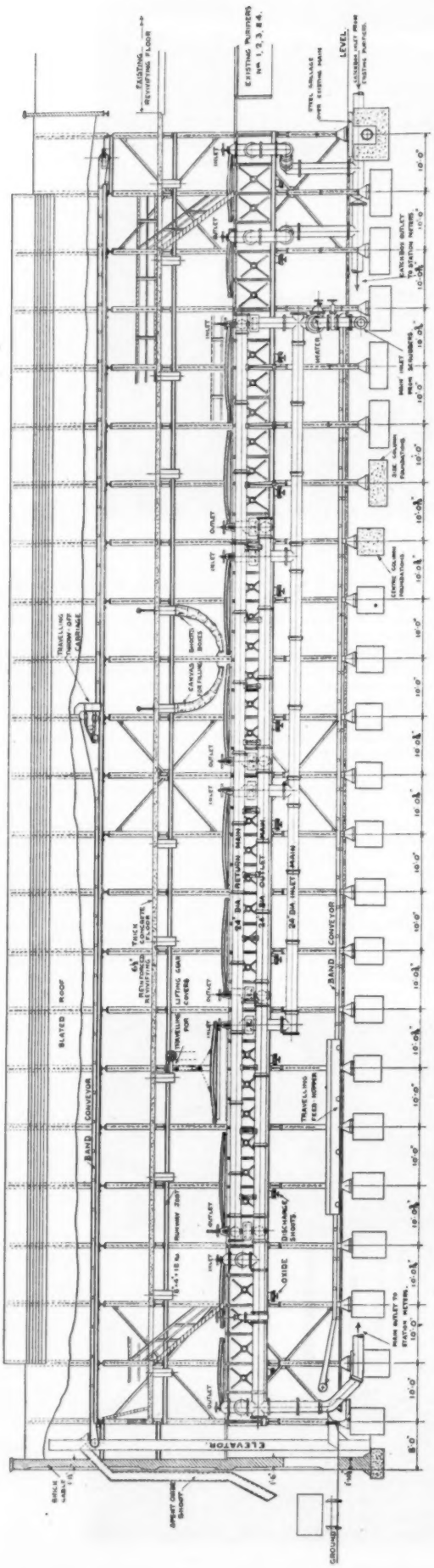


FIG. 1.—NEW PURIFIERS—ELEVATION.

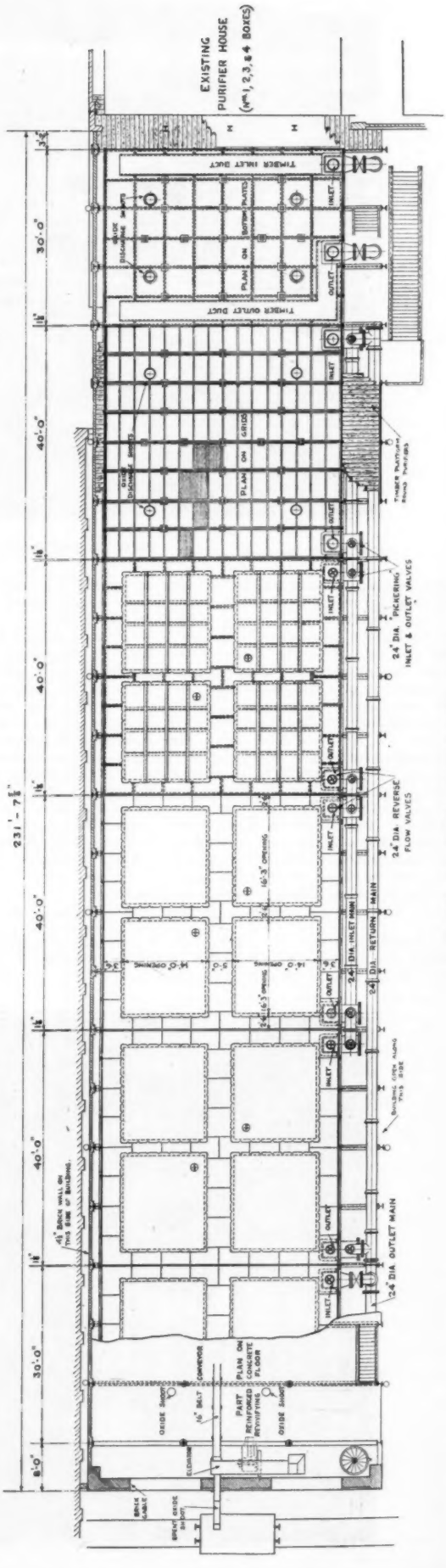


FIG. 2.—NEW PURIFIERS—PLAN.

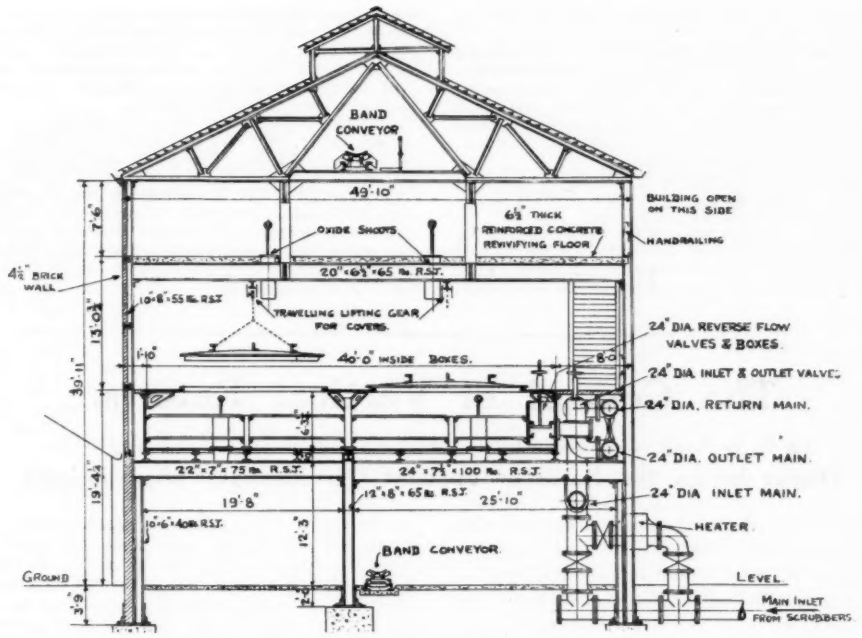


FIG. 3.—NEW PURIFIERS—CROSS SECTION.

Clutches are fitted to the shafting for disconnecting any part of the plant not required to be in use. The oxide breaker, elevator, and band conveyors are all driven by a 15-H.P. steam engine situated on the ground floor. The oxide handling plant has a capacity of 20 tons per hour.

OPERATION OF PURIFIERS.

The purifiers are worked on the backward rotation system, the sequence being changed usually once every day, and the new oxide is normally worked up to 50 p.ct. sulphur content in two or three foulings. The 40 ft. square boxes each have a

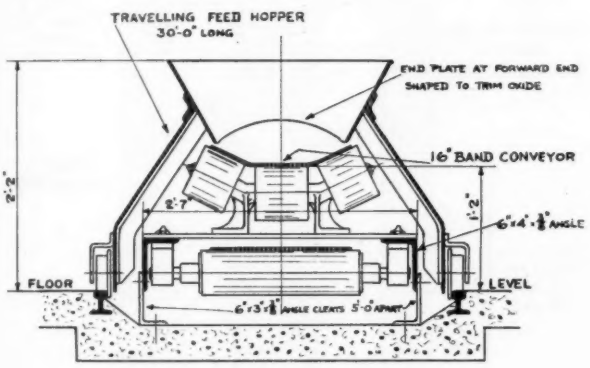


Fig. 4.—Ground Floor Conveyor.

[Cross Section through Travelling Feed Hopper.]

capacity of 165 tons of oxide, but usually 140 tons is used in two tiers each 21 in. thick, and with this latter quantity a purifier is normally emptied and refilled in one day of 8½ hours with a total of 16 men. With 25 men the same operation has been performed in 6 hours. 2·5 p.ct. of air, measured by meter, is constantly admitted to the gas at the inlet main to the purifiers by means of a small exhauster, for revivification *in situ*. The oxide is used in a very fine condition, and the moisture content kept round about 10 p.ct.

The old purifiers were heated by means of internal closed steam coils, but trouble was experienced with corrosion of the steam pipes, and an external heater was substituted. This method of heating has been used in the new purifiers, a steam heater being inserted in the inlet main close up to the purifiers. The temperature is maintained at about 80° Fahr. The bottoms of the new purifiers have not been covered with concrete, but have been given two coats of bitumen paint inside, as the intense corrosion which was at one time experienced in the old boxes has been successfully overcome by the use of soda-ash, which is spread evenly in a thin layer on each tier of oxide, 8 cwt. being used in each box, with practically complete extraction of cyanogen compounds. No experience has yet been obtained with the new purifiers of the efficacy of the upward and downward flow reversing valves. Separate analyses of the upper and lower tiers of oxide from the existing boxes, in which upward flow only is possible, show that the bottom tier invariably has a sulphur content of about 5 p.ct. more than the top tier.

COST OF PURIFICATION.

The new purifiers have not been working long enough for details of working costs to be given. The following particulars, however, refer to the older purifiers, and these results, although extremely good, will show still further improvement with the new plant.

	Year ended March 31, 1927.		Year ended March 31, 1928.	
	Pence per 1000 C.Ft.	Pence per Therm.	Pence per 1000 C.Ft.	Pence per Therm.
Wages	0·198	0·036	0·108	0·020
Oxide	0·020	0·004	0·010	0·002
Soda-ash, &c.	0·008	0·002	0·004	0·001
Grids	0·009	0·002	*Nil*	*Nil*
Electricity	0·006	0·001	0·005	0·001
Water	0·012	0·002	0·007	0·001
Total	0·253	0·047	0·134	0·025

Oxide handled per man per hour = 2·06 tons.

Appended is a schedule of costs for the new plant; I had also intended giving as an appendix the detailed calculations for the design of the structure, &c., but have been unable to include these owing to lack of space.

In conclusion, I wish to pay tribute to my Chief, Mr. Charles F. Blincoe, for his kind assistance in the preparation of this paper.

APPENDIX.

Schedule of Costs for New Purifiers.

	£	s.	d.
Demolition of existing buildings on site	257	15	0
Diversion and re-arrangement of existing connections	750	18	0
Excavating and concreting foundations	1,789	1	0
Cast-iron purifiers and connections, steel structure, and oxide handling plant	17,851	10	0
Reinforced concrete revivifying floor	844	17	6
Brickwork, rainwater pipes, steam and water pipes, electric wiring, and timber platforms	1,892	6	1
Slating to roof	506	10	0
Heater and connections	319	10	0
	£24,212	7	7

Discussion.

Mr. C. D. DRURY (Sunderland) congratulated Middlesbrough Corporation on their new plant and the way in which the management had met many difficulties. The design of the plant showed appreciation of future developments. It was a moot point as to whether to put up elevated plant. First costs were heavy. On a ground floor emptying and filling could be completed in one day. The results of the Middlesbrough plant, when the time taken and the work done was considered, seemed to be very satisfactory. They had been very careful about the load on the ground, but no doubt there was good reason for it. Their floor arrangement was interesting, but he did not know whether or not they saved by it. On the question of the preparation of oxide, at Sunderland, he said, they had put up a new disintegrator which they thought would be helpful, but

it had proved troublesome, and they had had complaints due to over-fineness.

Mr. A. E. Ruffhead said that at Darlington they were working with an oxide depth of 4 ft. to 4½ ft., and they could not complain of the results. They would notice that the purifiers were 40 ft. square, and that the catch boxes were 40 ft. by 30 ft. He was curious to know why the catch boxes were made smaller, and thought that they ought to be made the same size as the purifiers. It would, he considered, make no difference to the pressure.

Mr. J. E. Dixon (Newcastle) said that in the design of purifiers there apparently was no consideration given to the position of the check boxes. Why were these sometimes placed first?

A member of the Newcastle gas undertaking commented upon the similarity of problems that had been met at Middlesbrough and those which had been experienced on new plant in Newcastle. They were now completing plant comprising a reinforced concrete structure supporting purifiers 45 ft. by 55 ft. by 8 ft. They had large boxes, and had three fitted with division plates, so that they could work to 55 ft. by 22½ ft. With 8-ft. boxes in Newcastle they were operating at about 5½ ft., which was similar to Middlesbrough. They had had to contend with site difficulties. It had not been feasible to suspend the revivifying floor.

Mr. Pallister replied briefly to the discussion, saying, in reply to Mr. Drury, that they had had no complaints as to the fineness of the oxide. To Mr. Ruffhead's remarks upon the size of catch boxes, he said that the size they used had been governed by the site. They were the size which the site allowed. It was better, he was of the opinion, to place the catch boxes last.

The President said that Mr. Pallister had been connected with the extensions to the Middlesbrough plant from the start, and had acted as clerk of works. The whole of the brickwork had been done by their own workmen.

The Control of Vertical Retorts.

By H. B. Kendrick, Engineer and Manager to the Conway Gas Department.

[Paper before the North of England Gas Managers' Association.]

It has often been stated by vertical retort enthusiasts that the system of continuous carbonization in vertical retorts is more amenable to scientific control than intermittent systems such as horizontal retorts, and, though this contention has often been disputed, the intention of the present paper is to indicate some strong reasons in favour of it, and to suggest some possible improvements in control.

The Glover-West vertical retorts at the Rome Street Works of the Carlisle Corporation are not of the latest design. They are of the straight type, 21 ft. long, without the so-called steaming chamber, which was only in its experimental stage in 1921-22 when the Carlisle installation was being constructed. Gas-making was started in August, 1922, and for three years the average make per ton was 84 therms. The purpose of this paper is to show how by the application of scientific principles of control, and by the use of methods which would generally be impossible in other systems of carbonization, we have been able to increase the thermal yield per ton during the last two years to an average between 89 and 90 with an increase in saleable coke, the other bye-products remaining about the same.

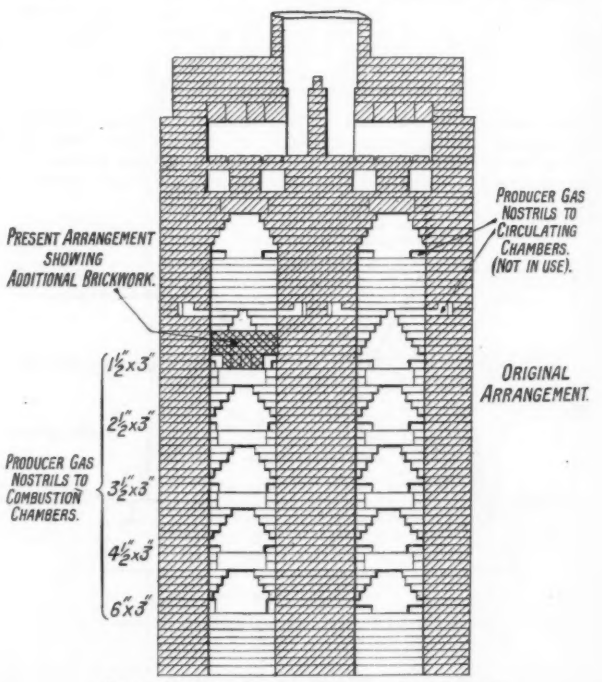
Table I.—*Working Results. Carlisle Corporation Gas Department.*

	1927-28.	1928-29.
Coal carbonized, tons.	29,773	30,612
Coke and breeze made, tons	19,202	20,216
,, ,, ,, per ton, cwt.	12·9	13·2
Coke and breeze saleable, tons	12,226	13,418
,, ,, per ton, cwt.	8·2	8·7
Tar made, tons.	2320	2442
,, ,, per ton, gallons	15·5	15·9
S a made, tons	304	372
,, ,, per ton, lbs.	22·8	27·2
Therms per ton, corrected	88·00	90·69

The retort bench consists of eight settings of retorts with a cross-section of 33 in. by 10 in. at the top, 21 ft. long. The retorts are set in a series of horizontally divided chambers, nine in number. As originally built, secondary air was circulated round the bottom chamber, afterwards passing up the back wall of the setting in a flue, from which supplies were taken to the five combustion chambers. The tops of the retorts are surrounded by three waste-gas circulating chambers in which heat was transferred to the incoming charge of coal from the products of combustion. Two years ago the bottom chamber was closed up and the secondary air was caused to pass direct from the atmosphere to the uptake flue in the back wall. It was found that the secondary air became sufficiently heated in its travel through the uptake and the ducts leading to the combustion chambers. The heat transference from the products of combustion rising up within the chambers adjacent to the secondary air gave a sufficient regenerative effect, while the air itself acted as an insulator to the back wall. On the other hand, cutting-out the bottom chamber prevented the cooling of the base of the retorts and increased the heat available for superheating the steam introduced just below the coke extractors. Incidentally, the cooler back wall makes the inspection of temperatures a much more comfortable duty.

There was also in the original design provision for the introduction, if necessary, of a supply of fuel gas and secondary air to the two waste-gas circulating chambers, but this was never used, and during the repairs of two years ago the passages were blocked up. With the exception of the slight alterations indicated, the heating arrangements have remained unchanged—that is to say, the bottom chamber is closed up, serving the purpose which in the later designs is served by the "steaming chamber;" there are five combustion chambers and three circulating chambers.

The system is adjusted to the quality and quantity of gas required in two ways—by varying the proportion of steam admitted to the retort and by varying the speed of the coke extractor, within the limits, of course, of complete carbonization.



Cross Section through Producer Gas Uptake.

Fig. 1

It should here be said with the greatest emphasis that the practice of attempting to increase the makes and alter the gas quality by increasing the vacuum in the gas stream coming from the retort cannot be too strongly condemned. This practice merely loads the gas with inerts; increases the temperature of the gas, entailing pitch troubles in the gas collecting main; increases the speed of travel of the steam through the charge in the retort, lowering the efficiency of conversion; and generally succeeds neither in increasing the production per retort nor the yield in therms per ton. The retort must at all times be kept under a slight pressure, keeping the pores of the retort material charged with carbon, preventing ingress of furnace gases and air, keeping the gas ways cool and moist, and giving optimum steam conversion, make per ton, and production per retort.

But some difference of opinion is permissible on the question of whether it is best to control the quality, within compara-

tively narrow limits, by varying the speed of passage of the coal through the retort, effected practically by the adjustments of the speed of the coke extractors, and consisting essentially in the control of the carbonizing period; or by varying the proportion of steam admitted to the retort, effected either by varying the steam pressure or adjusting the size of the orifice through which the steam is admitted. It is obvious, of course, that the two adjustments are inter-dependent. If the quantity of steam supplied is left unchanged, a decrease in the speed of the extractors—that is, a decrease in the throughput—is equivalent to an increase in the proportion of steam to weight of coal carbonized.

It should be pointed out that in the daily practice of the gas-works it is very seldom a question of altering the calorific value of gas made over wide limits. The alterations are not from 450 to 500 B.Th.U.; they are from 445 to 452. That is to say, it is a question of the quality of the gas sinking just below the declared value and requiring adjusting to a point safely above it. In these circumstances the writer is of the opinion that the quantity of steam should be adjusted to the temperature of the retorts, and that the final fine adjustment for quality should take the form of an adjustment of the throughput of the coal. Such an adjustment is very easily effected. It can be done in various ways. As the plant in question is electrically driven it was most convenient to control the speed of the motors. We inserted in the armature circuits rheostats giving a total speed variation of 150 r.p.m., so arranged that each segment of the rheostat causes a variation of ten revolutions per minute of the motors. This device is extremely easy to operate and may be roughly calibrated.

While studying the application of this method, we were led to observe that undue variations of the voltage of electricity supply can have a very considerable effect on the calorific value of the gas yield. Our supply is taken from the Corporation mains, and the following figures show our observations over six consecutive days in December, 1927 (Table II.):

TABLE II.

Day.	Calorific Values.			
	Varying Voltage.		Constant Voltage.	
		Difference.		Difference.
1.—a.m.	449·6		446·2	
p.m.	462·4		451·1	
		12·8		4·9
2.—a.m.	442·8		449·7	
p.m.	444·8		449·1	
		2·0		0·6
3.—a.m.	451·5		446·2	
p.m.	456·3		448·4	
		4·8		2·2
4.—a.m.	441·0		453·6	
p.m.	461·1		451·0	
		20·1		2·6
5.—a.m.	438·6		448·3	
p.m.	448·3		452·7	
		9·7		4·4
6.—a.m.	434·6		447·9	
p.m.	446·1		450·5	
		11·5		2·6
Average daily range		10·2		2·9

When this was reported to the electricity department they took steps to remedy the defect, and the result is shown in the second column.

With plants using several coals in rapid succession the accurate control of the calorific value is often no easy matter, because of their varying qualities and rates of travel. With rheostats installed as described, a capable charge-hand is able to maintain the quality within very narrow limits.

During these periods no adjustment whatever was made to the plant, and the three coals carbonized were similar in character and nearly constant in mixture. The figures show that it is of some importance either to equip electrically driven plant with automatic voltage control or, as the writer has in mind, with some form of apparatus by which the speed of the motor may be automatically controlled from the calorimeter.

STEAMING.

Steaming is now so widely practised where continuous vertical retorts are installed that no general comments are needed; but some warning against over-steaming does seem to be necessary. What is over-steaming? It may be argued, and probably is, that as long as increasing the amount of steam increases the make per ton one can go on increasing until the limit of the calorific value is reached. But a scientific study of the process reveals the fact that the efficiency of the plant may be very seriously affected by steaming to an extent unwarranted by the temperature of the retorts and the quality of the coal carbonized. Over-steaming, apart from being wasteful in steam, will slow down the rate of carbonization in the retort, and an increase in the make per ton may be more than neutralized by a decrease in the make per retort. Too much has been made of the so-called "sweeping" of the hydrocarbons out of the retort by high rates of steaming reducing the pyrogenic degradation of these compounds. We think that this advantage may be completely neutralized by the greatly decreased proportion of steam converted, owing to the decrease in time contact with the coke, and by other disadvantages which are cumulative. As the speed of exit of the gases increases, their temperature rises, causing overheating of the ascension pipes, with the usual complement of stopped pipes, hanging retorts, and pitched collecting mains. Excessive steaming is, of course, indicated by abnormal CO_2 content of the gas.

Table III. shows the beneficial effect of accurately correlating the steam supply with the temperatures and throughputs of the retorts.

In Table III. the high percentage of CO_2 in section A was noted. High temperatures were maintained in the attempt to reduce this, with, no doubt, a further detrimental effect on the hydrocarbons and the coke. Section B shows the result of reducing the steam. Lower temperatures are maintained with practically the same throughput, while the thermal yield per ton is increased from 91 to 95. Section C shows the effect of reducing top temperatures and throughput, maintaining bottom temperatures, obtaining an increase of thermal yield, with almost the same yield per retort.

Some of these results are shown in graphic form.

Section X on Graph.—During this period settings which needed repairs were going off, and repaired settings were being put to work. The low make per retort and thermal yield should be noted, showing the appalling waste which takes place through holed retorts.

TABLE III.

Data and Results for	A. April, May, June, July, Aug., 1927.	B. See Graph, Section B. May to July, 1928.	C. See Graph, Section C. July to Sept., 1928.
Gas made per ton of coal carbonized, c.ft.	20,450	21,170	21,950
Av. calorific value, B.Th.U.	448	451	451
Therms per ton of coal	91·4	95·4	99·1
Gas made per retort per 24 hrs., c.ft.	46,360	47,850	47,640
Coal carbonized per retort per 24 hrs., tons, av.	2·24	2·266	2·172
Thermal prod. per retort	202	217	215
Steam per hr. in lbs. per retort, av.	173·4	161·0	184·6
,, p.ct. on coal carbonized	20·7	19·0	22·8
*Coke to producers, lbs. per therm	5·6	4·5	4·9
Analysis of coal gas, p.ct. vol.—			
CO_2	5·7	4·4	4·9
O_2	0·3	0·3	0·3
C_nH_m	1·7	1·8	1·8
CO	15·7	17·4	17·9
CH_4	19·4	19·6	20·1
H_2	51·3	50·7	49·6
N_2 (by diff.)	6·0	5·8	5·4
Av. temperatures, ° C.—			
Top circulating chamber	1132	1010	970
Combustion chambers 5	1307	1207	1180
Combustion chambers 4	1338	1277	1240
Combustion chambers 3	1321	1289	1296
Combustion chambers 2	1314	1310	1300
Combustion chambers 1	1267	1291	1289
Coals carbonized. (For analyses, see Table IV.)	P.Ct. A 33·9, B 31·9, C 11·1, D 11·1, E 4·2, F 5·9, G, H, K 1·9	P.Ct. A 35·2, B 27·3, G 13·7, Others 10·2	P.Ct. A 48·9, B 22·8, C 19·0, G 9·3

* This includes all coke for heating up spare settings.

Table IV. gives analyses of the coals carbonized.

TABLE IV.

Coal	A	B	C	D	E	F	G	H	K
District of origin	C	C	C	C	C	C	N	C	Y
H_2O	2·4	3·3	1·8	2·0	1·7	1·8	1·4	2·3	1·4
Dry basis—									
Vol. matter	31·87	33·31	32·52	34·14	31·33	33·30	31·54	32·86	31·34
Ash	4·43	5·57	5·20	3·62	8·90	5·50	8·62	5·94	11·51
Fixed carbon	63·72	61·12	62·27	62·23	59·15	61·20	59·84	61·20	57·15
Coke button	Large	Large	Small	Very large	Fair	Fair	Fair	Large	Poor

C = Cumberland. N = Northumberland. Y = Yorkshire.

Section B on Graph.—In the middle of this period the steam was increased and the throughput reduced, with no alteration in the heats. The make per ton, therms per ton, and make per retort all show a decrease. It was realized that to obtain any benefit from further steaming the throughput must be reduced to increase the steam reaction zone, and at the same

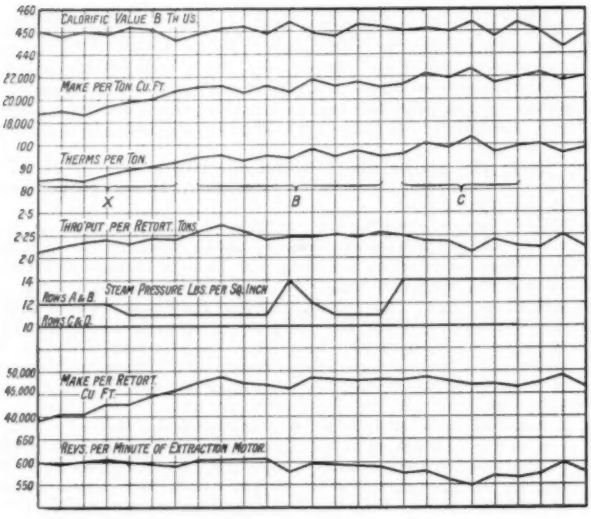


Fig. 2.

time it would be necessary to employ lower top heats to avoid over-cracking the hydrocarbons. The effect of these alterations is shown in section C.

Control of Heats.

Latterly, while concentrating on fuel conservation, it has been very forcibly impressed upon the writer that the usual method of working settings under a partial vacuum is somewhat wasteful in both fuel for heating purposes and of coal gas itself.

There are, at present, two general methods of inducing fuel gas and air into the combustion chambers, both creating a partial vacuum. The first and most common is natural draught, which fluctuates considerably owing to atmospheric conditions, and the second is induced draught used in conjunction with certain types of waste-heat boilers. Working under a vacuum naturally results in quantities of uncontrolled air being drawn into the settings, thus lowering the flame temperature, or using excessive quantities of fuel to maintain temperatures.

It was felt that, by increasing the pressures in the producer gas uptake by suitable alterations, in order to force the fuel gas into the heating chambers, it would be possible to lower the vacuum on these chambers to a minimum compatible with drawing in sufficient air for combustion, that more regular and even heating would be possible, and that the fuel consumption would be less.

The producer gas uptakes were altered, as shown in fig. 1, and had the effect of forcing the pressure lower down. A saving of fuel immediately followed, and later it was found possible to change the fire-cleaning period from 4 to 8 hours. The vacuum on the settings was reduced to such an extent (see Table V.) that all the circulating chambers are under a heavy pressure, so that no uncontrolled air can be drawn in to combust any excess CO or coal gas from leaky retorts that may be present; thus top temperatures may be kept as low as desired.

Table V.—*Average Pressures in the Settings.*

[Inches of Water.]

		Altered Settings.	Unaltered Settings.
Circulating chambers	3	+0·07	±0·00
	2	+0·05	−0·02
	1	+0·03	−0·03
Combustion chambers	5	+0·01	−0·05
	4	−0·01	−0·07
	3	−0·03	−0·09
	2	−0·05	−0·11
	1	−0·08	−0·13
Producer uptake (Opposite Combustion Chamber Number.)	5	+0·07	+0·03
	4	+0·05	+0·01
	3	+0·03	−0·01
	2	+0·01	−0·03
	1	−0·01	−0·05

The lowering of the vacuum in the heating chambers has another aspect. The less the difference in pressure between that inside the retort and that outside, the less the leakage of coal gas from the retort. The pressures within the retort, using nut coals, are shown in Table VI., and it is conceivable that, when employing a highly caking coal, such as Durham, they will be even greater. Leakage may take place through cracks formed and in joints which have opened during the shutting-down and re-starting of settings, and through holes in older settings. Also, it has been suggested that leakages take place through the retort material itself, although it is difficult to see that this can be of any consequence, as the pores of the material become saturated with carbon.

Table VI.—*Pressures in the Retort.*

Distance from Top of Brickwork.	Inches of Water.
Top of brickwork	0·02
3 ft.	0·28
5 ,,	0·21
7 ,,	0·37
8 ,,	0·40
13 ,,	0·25
15 ,,	0·25
17 ,,	0·21

This leads us to the question, "Why not balance the internal and external retort pressures?" The idea of balancing has many points in its favour. There will be no leakage of air into the settings; hence we shall approach nearer to the theoretical amount of fuel required. As the quantity of both fuel gas and air would be under an infinitely greater degree of control than at present, variations in temperature would be correspondingly less. Any leakage of coal gas would be eliminated.

Fluctuating temperatures are due to two main causes:
(1) Variations in draught.
(2) Variations in quantity of fuel gas due to changes in the size of fuel.

The latter may be observed by noting the pressures in the fuel gas flues.

At present we have no means at our disposal to compensate for these variations, as it is manifestly impossible to alter control dampers for every change in atmospheric conditions, nor is it economically sound to grade the fuel to the producers.

It has often been stated in the Technical Press that it is not high heats that are detrimental to brickwork, but fluctuating temperatures. It is easy to visualize that, by having such a degree of control as would be possible by working under pressure, heats would be maintained constant whatever the conditions within the producer.

This paper would not be complete without some attempt to arrive at the probable cost of working under pressure. It is not suggested that working under pressure could be applied to plants as built at present; some modifications would be required. As this would only be done when the settings required rebuilding, the cost cannot be charged to under-pressure working. There is the capital cost of blowers and the running cost to consider.

Assuming the cost of blowers, &c., to be £750 for a works carbonizing 32,000 tons of coal per annum, and allowing 10 p.ct. for interest and depreciation, the cost per ton of coal carbonized is 0·56d., or 0·006d. per therm.

Assuming a total fuel consumption of 15 p.ct., which, I think you will agree, is not too low, the cost of current for blowing at 1d. per unit is 0·994d. per ton, or 0·0112d. per therm, taking 88 therms per ton (see Appendix). This gives a total cost per ton of 1·554d., or 0·172d. per therm.

Against this is the saving in coke, which is assumed to be 3 p.ct. With coke of 20s. per ton the saving is 7·17d. per ton of coal carbonized; and the net saving is 5·616d. per ton, or 0·064d. per therm.

From these figures alone working under pressure is justified, but we must also take into consideration the additional yield per ton that would most certainly result, and also the longer life of the settings.

It is apparent from the data and results given that high results are not necessarily the product of high heats and large quantities of steam, but may be obtained by careful manipulation of the heats and throughput, and regulation of the weight of steam in accordance with the bottom temperatures.

A further point is the importance of having complete control over the zoning of the heats, which this type of setting permits. Both the design and degree of control play a great part in obtaining results, and I venture to suggest that higher average yields are yet possible by improved design and a greater degree of control.

In conclusion, I wish to thank my former Chief, Mr. J. E.

Blundell, for his help, and his kindness in permitting me to publish the figures given in this paper.

APPENDIX.

Calculations to obtain horse-power of fan motor.

1 lb. of carbon burned to CO_2 requires 11·56 lbs. of air. Assuming that the total fuel consumption is 15 p.ct. on weight of coal carbonized, then air required per ton of coal

$$= \frac{2240 \times 15 \times 11{\cdot}56}{100}$$

1 c.ft. of air = 0·0809 lb.

Therefore volume of air = $\frac{2240 \times 15 \times 11{\cdot}56}{100 \times 0{\cdot}0809}$ c.ft.

Assuming a throughput of 18 tons of coal per 24 hours per setting, 1 ton of coal is carbonized in 80 minutes.

Therefore volume of air per min. = $\frac{2240 \times 15 \times 11{\cdot}56}{80 \times 100 \times 0{\cdot}0809}$ c.ft.

= 600 c.ft. of air per min. (approx.) per setting.

H.P. of fan motor = $\frac{5{\cdot}2\ h \times V}{33{,}000}$

where h = press. in inches of water (say, 5 in.)

V = Volume of air in c.ft. per min.

Therefore H.P. = $\frac{5{\cdot}2 \times 5 \times 600}{33{,}000}$

= ½ H.P. approx.

Assuming an efficiency of 50 p.ct., H.P. = 1.

A 1-H.P. motor uses 0·746 unit of electricity per hour.

With current at 1d. per unit, cost of blowing per hour

= 0·746 per hour = 0·994d. per ton.

At 88 therms per ton = 0·0113d. per therm.

We have assumed that 3 p.ct. of fuel is saved on our present total fuel consumption.

$\frac{2240 \times 3}{100}$ = 67 lbs. of coke, at 1s. per cwt.

$\frac{67 \times 12}{112}$ = 7·17d.

Therefore additional coke for sale would bring in 7·17d. per ton of coal carbonized.

Discussion.

Mr. A. C. HOVEY (London) said that the Association was indebted to Mr. Kendrick for submitting particulars of his careful observations of and adjustments to the Glover-West vertical retort installation at Carlisle, the operation of which had been under his immediate care during the past three years. The design of the settings there was over ten years' old, and the author had been able to effect some modifications, bringing it intimately into line with the principles of present-day construction. The generation of water gas by the introduction of steam necessitated the presence, near the base of the retort, of incandescent coke at such temperature as would effect the conversion of the steam. If secondary air was heated by passing it around the base of the retort, the incandescent coke was cooled to such an extent as to prevent conversion of steam of such volume as was used in the lower calorific grades of gas. Consequently this method of heating the secondary air had been superseded by that indicated by Mr. Kendrick. Superheating the steam before entering the retort by waste gas was economical, and assisted in the steam conversion and the output of the retort. The author was correct in stating that a pressure should always be maintained within the retort, but that pressure should be very slight. With highly coking coals, suitable heating of that section of the retort, and reasonable attention by the top attendant, would keep pressures low within the retort, so that conditions there were not far removed from those in the combustion and circulating chambers.

Some further improvements might be achieved towards a balance at all levels. Speed of extraction and the quantity of steam were certainly interlinked. The extraction was easily adjustable over a wide range, and an accurately graduated valve for each retort permitted minute regulation of the volume of steam. Variation of voltage was serious. The adjustment of the extractor main drive by rheostats, when electric motors were used, should be satisfactory, and there were several other methods in use for varying the speed of the drive, and so of the extraction generally. A counter on that gear was a useful adjunct to record the speed continuously. To obtain full value from the coal and from the plant, temperatures should be well maintained.

Steady induced draught through waste-heat boilers was the best procedure. Pressure should be at all times maintained in producers and uptakes by keeping the fuel and the grate in proper condition. Producer fire cleaning on the more modern installations might be at intervals of 24 hours with step grates, without any alterations to the uptakes or the dampers. If the fuel contained a large proportion of fine breeze, it would not give such easily attained good results in quality and quantity of producer gas. Maintenance of proper temperature within the producer was necessary, and undue disturbance of fuel should be avoided. The various items Mr. Kendrick had dealt with, Mr. Hovey concluded, were of great importance in attaining the efficiency desired and possible in the conduct of carbonization. He had been fortunate in being Assistant to Mr. J. E. Blundell, of Carlisle, a pioneer of steaming in continuous vertical retorts.

Mr. J. E. DIXON (Newcastle) thought that Mr. Kendrick's observations had been made in a very concise manner. With vertical retorts, conditions varied throughout the country considerably, thus giving different results. Class of coal used and the consistency of its quality entered a great deal into the whole question. He was in agreement with the author on the matter of altering steaming arrangements. Some cokes would almost defy steaming. Some were so hard that when the charge came down the retort it retained the shape of the retort, and steam coming into contact with it only surrounded it. The introduction of the modern retort with the bell-shaped bottom had minimized this difficulty in that the coke broke into large pieces. Where the electricity was generated on the premises, alteration of pressure was negligible, and need hardly be taken into account.

Mr. L. H. SENSICLE (Newcastle) thought that the continuous retort was subject to greater control than the intermittent retort. He was in agreement with the author upon the question of the adjustment of calorific values. Pulling on the retorts simply meant pulling in the products of combustion. There had been a certain type of oven used in the coking industry in which air was supplied under pressure. After a time, however, this had been found hopeless, the products of combustion streaming through into the oven; and it had been found better to work under a vacuum.

Mr. W. E. DRAKE said that he had listened with great interest to the paper, and that, although he did not wish to introduce any contentious matters, there were certain points in the paper with which he was not wholly in agreement. On the subject of pressure *versus* vacuum, he thought that when working with a vacuum there was a tendency to draw the products of combustion into the retort, while, when working with pressure, there was the possibility of forcing the air and gases through into the setting, with the chances of degrading the coal gas. There were thus disadvantages on both sides.

The PRESIDENT remarked that he had been greatly impressed by the facility for control of the vertical retort. In this respect he had always been struck by the wide use of indicating and recording appliances. It was indeed a commendable practice; these scientific instruments enabled much valuable information to be secured and put to advantage. On the Continent they were widely applied, and perhaps this was one of the reasons why Continental practice was getting so far ahead of practice in this country, at least in some respects. Mr. Kendrick, he concluded, would reply to the discussion in writing.

Parliamentary Intelligence.

[From Our Special Correspondents.]

House of Lords.

Private Bills.

The Brighton and Hove Gas Bill has been read a second time. The Petition for the Hartlepool Gas and Water Bill has been referred to the Standing Orders Committee by the Examiners, on account of non-compliance with the Standing Orders.

The Select Committee on the Ascot District Gas and Electricity Bill meets to consider it to-morrow at 11 a.m.

Coal Mines Bill.

In the course of the Debate on the Second Reading of the Coal Mines Bill, the Earl of Lindsay said that when one came to deal with gas and electricity it had always been a marvel to him that the coalowners of this country should be content to supply those two industries with coal at ridiculously low prices, to be used in turn for the benefit of those industries. It might not be generally known that at the present moment gas and electricity concerns—public as well as private—were making a gross profit somewhere in the neighbourhood of 30 million pounds a year. He had had those figures checked, and was told that they were correct. In 1928 the coal mining industry lost something like 9 million pounds. Surely there was some room for adjustment there. It would be said that this Bill was going to raise the price of coal. Of course it was. That was why it was introduced; and he hoped it would. He saw no reason why gas and electricity concerns should not pay more for their coal. There was no object in exaggerating their position. He had had it worked out and could give an example. If there was made an increased charge of 1s. 4d. a ton to the gas concerns in this country—he did not suggest for a moment it should be done—that amount could be recovered by an additional charge of 1d. per 1000 c.ft. Surely that was not too big a price to pay to restore a certain degree of prosperity to the coal mining industry.

House of Commons.

Private Bills.

The Hartlepool Gas and Water Bill has been certified by the Lord Privy Seal to be a Bill in relief of unemployment. This has the effect of expediting its progress through Parliament. The Bill has been referred to the Select Committee on Standing Orders as a result of a Report from the Examiners that the Standing Orders have not been complied with.

The Petition of the Derbyshire County Council against the South Yorkshire and Derbyshire Gas Bill has been withdrawn.

Special Orders.

Plans have been deposited in connection with the Gloucester Gas Order.

A Special Order has been presented on the application of Worthington Church and Edmund George Smithard, carrying on business as the Swaffham Gas Light and Coke Company.

Successful "B.C.G.A." Conference at Ayr.

Gas the Modern and the Future Fuel.

Promoted by the British Commercial Gas Association, a Scottish District Conference was held in the Town Hall, Ayr, on Friday last, and was attended by delegates from all parts of Scotland. The delegates comprised Chairmen, Conveners, Directors, and Managers of gas undertakings, whether municipally or privately controlled. The two local concerns—viz., the Ayr Gas Company, Ltd., and the Newton-on-Ayr Gas Company, Ltd.—associated themselves prominently with the proceedings, and played a generous part in extending hospitality to the visitors. Mr. J. M. Goodwin, Chairman of the Ayr Gas Company, presided at the two sessions of the conference proper, while at the luncheon Mr. T. Frew, Vice-Chairman of the Newton-on-Ayr Gas Company, occupied the chair.

THE MORNING SESSION.

Mr. Goodwin, in welcoming the delegates, said this was the first occasion on which the "B.C.G.A." had held a conference at Ayr.

Provost J. S. Stewart (Ayr) followed with a few words of welcome to the delegates. From the houses which were being built in their own district at the present time, he said, it was evident that gas could not be dispensed with.

The Chairman at this point of the proceedings introduced Mr. F. W. Goodenough, C.B.E., who opened a discussion on

Gas—The Modern Fuel, and the Fuel of the Future.

Mr. Goodenough said:

It is doubtless the fact that we have made such strides in developing the efficiency of electricity as a lighting agent that leads so many people to expect that sooner or later there will be a corresponding advance in its efficiency as a fuel. It is in that unfounded belief that are based so many hopes that are doomed to disappointment. We do not, as stated, know the limit of efficiency of electricity as a lighting agent; but as a medium for the conveyance and production of heat, it is limited strictly and, in this country, fatally. "In this country, fatally," because the great insuperable obstacle to the economical generation, distribution, and utilization of heat in the form of electricity in this country is that there is, speaking broadly and practically, no means of generating electrical energy here other than by the conversion of the potential heat energy of coal into electrical energy, and that is a most wasteful process.

I will not go into details here, but will merely state briefly that the most efficient generating station in the world does not deliver to the user more than 20 p.ct. of the potential heat in the coal burnt to produce the current. No less than 80 p.ct. is used up at the station or in distribution. At the gas-works over 75 p.ct. of the potential heat in the coal is recovered for sale as gas, coke, or chemical bye-products. That is why gaseous fuel can be supplied so much more cheaply than electric current.

Put briefly, the comparison is this. One kilowatt-hour of electrical energy will evolve 3420 B.Th.U. One therm of gas equals 100,000 B.Th.U., or 29 times the heat value of a unit of electricity. Allowing for the somewhat higher utilization efficiency of electric heating, it is broadly true to say that to compete in terms of cost with gas, electricity must be supplied at a price per unit not greater than 1-24th of the price of gas per therm. If gas is obtainable at 6d. per therm, electricity as fuel can only compete on cost at ¼d. per unit. If gas is 8d., electricity must not exceed ⅓d.—and so on.

These are not merely mathematical comparisons. They are borne out by practical experience. Every day—literally every day—in London we are replacing electric cookers and heaters by gas cookers and gas fires, because consumers are tired of the cost and inefficiency of the former—and this not in districts merely where cost is a prime consideration.

And yet some local authorities are actually refusing to allow gas to be installed in their housing estates and are compelling their tenants to use—what? Electricity for cooking and heating?

On the face of it, Yes. But, in fact, very often, it is coal for heating—where if they were allowed to they would use gas and save befouling the atmosphere with smoke—and either coal or often oil for cooking, that they are actually causing to be used for the practical work of the home. It would be ludicrous, if it were not more serious. Local authorities are setting back the clock, causing reversion to oil and crude coal and to smoke-laden air, while thinking they are being progressive and futuristic.

What is there magical about that form of the potential energy in coal called electricity (distributed through a wire) that causes it to be so favoured, while that form of the potential energy in coal called gas (distributed through a pipe) is despitefully condemned? Nothing that any practical person can specify.

Gas can be regulated as to the measure of heat to be given in cooker or in fire more closely and easily than electricity. Gas fires, because they must be ventilated as must a coal fire, ventilate the rooms in which they are used—a most important hygienic consideration. Electric radiators do not, and are actually the cause of some builders omitting flues from living rooms, which is hygienically condemnable and physically detestable.

Gas is thoroughly dependable. Failures of gas supply are practically unheard of. Failures of electric supply are common-places of city life. Gas is so safe to use that fatal accidents (as distinct from suicides) from its employment are negligible, and its adoption in the working homes of the country has reduced a former prolific source of fatality—the cheap oil lamp—to a tenth of its former results. Gas is so cheap to use as a fuel that all the great electric lamp and appliance makers are enormous users of gas, just as many gas-works are large users of electric power.

There is little but the novelty and the mystery of electricity to commend it as a fuel. Is it not, therefore, about time that our public men and women and our local authorities, as practical people and practical organizations, got fancies out of their heads and facts into them?

It should be borne in mind that for lighting, gas is preferred by very many thrifty housewives, as well as by business men who look carefully at costs, because it is the cheapest artificial illuminant obtainable. It possesses the advantage that it gives heat as well as light. This is greatly appreciated in particular by the working-man's wife, who finds that she often gets value for both sides of the penny she puts in the slot-meter. It is roughly true to say that she can get twice the light for half the money by gas as compared with electricity.

Everyone ought to have the opportunity of choosing between gas and electricity for lighting. No one ought to be compelled to use electricity if they do not want to. The result, as I have said, of such attempted compulsion by housing authorities is very often the use of an oil lamp, because gas is not available.

There is room, ample room, for both gas and electricity in the service of the peoples of this country. They can, between them, make life far more pleasant, endurable, and profitable in our towns and cities and in our homes and our factories—I have no time unfortunately to do more than refer to the amazing growth of the use of gas in the myriad processes which call for heat treatment of the materials employed in the production of goods (or of the food stuffs employed for the feeding of those engaged in that production), or I could tell a most interesting and enlightening story—but it is nothing short of folly to think that either of these great services is going to displace the other. While, it is true, there is a border-land that can be argued over and competed for, each has a great field of its own for the service of the nation, and the fuel field is, with inconsiderable exceptions, the field that can best be served by the products of the gas-works. I hope this very incomplete examination of the facts may be of some help in preventing waste of time, money, and temper in experiments in that field with other sources of potential heat. It is much cheaper to borrow experience than to buy it.

Discussion.

Mr. T. W. Harper (Ayr) said that Ayr was not an industrial town. There were only a few small industries, so that it might be taken as a town of a residential nature. During the post-war years, the gas undertaking in Ayr had applied no special method in letting out gas consuming apparatus on free loan or simple hire, except that there were let out on hire-purchase terms certain types of gas cookers—all other apparatus being sold for cash. No profit was earned on apparatus sold on hire-purchase and fitted in consumers' premises; cookers were sold at net cost, *plus* a small charge to cover the outlay in fitting; while fires were fitted at the listed prices of manufacturers, although the cost of supplying and fitting these fires was generally in excess of the listed prices. On the other hand, lighting fittings were supplied at net cost, no charge being made for fitting, these being mostly replacements of old and worn out fittings by those of modern type. During the past ten years they had sold and fitted 1680 pieces of apparatus. This figure included cookers, fires, circulators, range plates, geysers, and radiators; and the total value of these was from £12,000 to £13,000. This was a considerable sum; and if it were capitalized it would mean a charge on revenue of £650 at 5 p.ct. If they included the charge for redemptions at the same rate of interest, the total would be £1300, which, based on the present sales of gas in Ayr, would amount to 3·25d. per 1000 c.ft. of gas sold.

The increase in gas sales during the past ten years amounted to 52 p.ct. This increase must be taken as satisfactory when it was borne in mind that the increase in the number of consumers was only 70 during that period. The average consumption per consumer ten years ago was 16,500 c.ft. per annum, and at the end of the financial year on Jan. 31 last, the average consumption per consumer was 28,000 c.ft. per annum, being an increase per consumer of almost 52 p.ct. This increase had been obtained by developing the demand for gas in semi-industrial establishments such as bakeries,

restaurants, tea rooms, cinemas, and the local hospital. The price charged to all consumers was operated on a sliding-scale basis, the flat rate at the present time being 3s. 1½d. per 1000 c.ft., subject to a rebate according to the amount of gas consumed per annum, the rate of rebate being from 5 p.ct. to 15 p.ct. At present they had upwards of 100 consumers coming under the sliding-scale basis, and it was just possible that the starting-point of the rebate was too high—namely 100,000 c.ft. per annum. It was their intention, however, at the first opportunity to reduce the figure to 50,000 c.ft. per annum.

With reference to the possibility of increasing the demand for gas, there were to his mind two distinct fields—namely, water heating for domestic use and for central heating—if only prices could be arranged to meet this class of business. He found that the cost of supplying and fitting a 20-gallon circulator was anything from £15 to £18 for the completed job.

Industrial Developments in Glasgow.

Mr. J. W. McLusky (Glasgow) said:

Statistics prove that within the past five years, gas salesmen, assisted by makers of every type of apparatus for every known heat requirement, have made tremendous progress. The increased sale of gas recorded by practically every undertaking does not tell the whole story, inasmuch as gas appliances and heating apparatus in many trades are not working to anything like capacity because of trade depression. Recent development in the industrial load within the Glasgow area of gas supply has been more pronounced in the baking industry than in the general engineering and allied trades. These latter trades are suffering from lack of foreign orders, due in large measure to the fact that the repairing of old and the building of new ships, and general engineering and dockwork, have been extensively developed in European countries.

As an indication of how the baking industry is progressing in the use of gas for baking bread, cakes, biscuits, and oatcakes, the following is an analysis of the number of ovens in use up to the time of writing, with the total yearly volume of gas consumed in the Glasgow area for this purpose only:

No. of Ovens.	Bread.	Cakes.	Biscuits.	Oatcakes.	Yearly Total Consumption.
50	6	7	36	1	189,331,800*

* This figure equals the total sale of the Newton-on-Ayr Gas Undertaking.

The average price paid on the foregoing total consumption is 2s. 4d. per 1000 c.ft. = 5·958d. per therm, while the largest consumers (taking over 50 million c.ft. per annum) pay 1s. 4d. per 1000 c.ft., or 3·405d. per therm. These ovens of the travelling tray type are installed in fifteen important establishments in Glasgow, and are giving the utmost satisfaction.

As an indication of how popular this type of oven has become, it is only necessary to add that the output of one firm alone is consuming half-a-million c.ft. of gas per hour when all are in operation.

Mr. David Fulton (Helensburgh) said:

Many people nowadays believe that electricity is supreme as an illuminant, and that gas is out of date. The public should not be allowed to base opinion on nebulous impressions, and a great service can be rendered by keeping constantly before them information regarding the virtues of gas for lighting, so that they may be assisted to a fair judgment of the merits of gas and electricity. Much can be said in favour of gas lighting, and members of the gas profession who fail to help make known the advantages of gas do a great disservice not only to themselves and the industry, but to the public.

In the church of which I am a member, gas lighting was replaced by electricity some four years ago. Since then there have been constant complaints of draughts, and an expert heating engineer who was consulted recently advised that two large gas lamps of the "Sun" burner type should be fitted in the roof of the church. He said that he had had many similar complaints from churches where electricity had been substituted for gas. This is testimony to the heating and ventilating effect of gas lighting.

Our schools in Helensburgh are all lit by gas, and the splendid results obtained from the use of modern superheater lamps regularly maintained in good order are a striking example of the high quality of gas light, with entire absence of anything in the nature of glare. Satisfactory results from gas lighting depend on an adequate pressure of gas of constant calorific value and composition, and regular maintenance.

Maintenance System at Helensburgh.

Until within the past year we had no systematic scheme of maintenance, feeling that in a residential district the work could be well left to arrangement between consumers and the local plumbers. However, circumstances decided us to make a systematic house-to-house visitation, and the results occasioned us very great surprise. The unsatisfactory state of lighting burners, gas cookers, and gas fires was a revelation, and never again shall we be content to await complaints from consumers, or to leave in other hands the duty of maintaining appliances. The service has been very greatly appreciated by the public, and has been the means of preventing many consumers going over to the use of electricity for lighting. The service is free, excepting that materials supplied are charged at net cost. An obstacle to good gas lighting is to be found in the continued use of old-fashioned gas burners, and a vigorous campaign is being carried out to induce consumers to introduce modern high-grade burners. Very frequently a sample modern burner is fitted as a demonstration, with the result that in most cases all the burners are immediately exchanged. Burners become less efficient as time goes on, and it would be well to endeavour to inoculate the public with the idea that it would be well to change the burners (say) at least every five years.

Many of the difficulties of ensuring a satisfactory gas supply are due to the inadequate size of service pipes, and some time ago we reached the conclusion that it was desirable to enlarge, without cost, service pipes which were not capable of giving the service required. This is proving remunerative, as consumers are able to use gas appliances much more freely, and gas consumptions show a definite increase. It is accordingly an opinion that where services have been laid in the first instance at the cost of the proprietors, thereafter they should be maintained and, when necessary, removed by the gas department free of charge.

We are believers in consumers owning their own gas appliances, and no appliances are given out on free loan. Ordinary cookers are let out on a terminable hire agreement. When the consumer has paid annual rental for ten years, the appliance becomes his own property. High-grade cookers are let out on a five years' hire-purchase system.

The usefulness of the gas fire in providing comfortable warmth, and in helping to reduce the servant problem, is evidenced by the fact that many of our consumers have from five to twelve gas fires in their homes. Many of the houses are fitted throughout with gas fires—except for perhaps one room. The total number of gas fires fitted is over 3000. The value of gas fire service to the consumer and to the Department is demonstrated by the fact that the average sale of gas per consumer is about 53,000 c.ft. per annum. All the local housing schemes are fitted with gas for lighting, with a gas cooker, and a wash-boiler. In one of the schemes there is, in addition, a gas fire in one bedroom of each house.

Mr. H. H. Gracie (Edinburgh) said:

We sum up our conclusions in these few words: "You want the best Fuel; we have it." And this fact is borne out by the great increase in demand for gas all over the country; within the past ten years or so increases of 50, 60, and even 100 p.ct. are not uncommon. This shows that its benefits are being more and more appreciated by the consumers, and that its claims are being fulfilled.

We have studied your needs, and have come to the conclusion that you want a constant and adequate supply of fuel at a uniform heating value; and we are prepared to give you this. You want that fuel—which must be clean and labour-saving in use—at a reasonable price; we offer it so. We also supply the best apparatus to utilize it efficiently and economically. We bring it into your homes or business premises and leave it ready at your hand so that you can use it or discontinue it as you feel inclined; we even provide you with facilities to take a pennyworth at a time, and pay for it as you go, without the trouble or annoyance of accounts. We supply the apparatus in artistic designs, to suit any taste, certain types free, some on hire or, alternatively, on easy terms of payment. We keep that apparatus in order so that it is always available, and we provide a staff and give lectures and demonstrations to teach you how to use it to the very best advantage. We call that "service," which is available night and day, and we offer it all at a price that can compete economically with any other heating medium, and we give reductions to those who take it in large quantities. You want a clean atmosphere, a healthy, smokeless home and city to live in, and we offer you the facilities to attain that ideal. Will you accept?

Bailie James Stewart (Perth) said that the problem of the country at present was that of unemployment; and in view of the critical state of the coal industry he foresaw greater unemployment if gas was to be replaced by large hydro-electrical stations which were desecrating the landscape of the countryside.

Brief contributions to the discussion were also made at the forenoon session by Bailie Farmer (Leven) and Mr. W. M. Mason.

AFTERNOON SESSION.

At the afternoon session the proceedings opened with an address by Dr. W. F. Brown, M.B., Medical Officer of Health for Ayr, on the subject of "Health and Hygiene." He dealt largely with the smoke pollution of the atmosphere, and maintained that if they could get the public educated up to the fact that the smoke nuisance was unnecessary, then they would not be far from a solution of the problem.

Mr. Peter Fyfe, the late Director of Housing for Glasgow, dealt with "The Gas Industry's Contribution to Public Health." He said: Who or what can save our cities and our citizens from the terrible defilement of the air caused by our thousands of domestic and office fires being kept alight by the combustion of bituminous coal? We can appeal to no class of citizen except to the gas managers of Great Britain. I presume the whole difficulty of the problem is one of cost. If gas could be supplied at a cost for household heating and cooking not much greater than the price of coal, I believe no reasonable citizen would continue to store the latter in his bunker. The question is one of economics. I therefore invite you to consider the problem from this essential point of view. Now how much coal does the average working-class citizen burn in his two or three apartment house (say) during each week for heating and cooking? I do not think I am far from the mark when I put the quantity at 2 cwt. in that period. This quantity at the present average price of 1s 9d. per cwt. involves an expenditure of 3s. 6d. per week, and if we add 6d. a week for sticks in order to kindle the coal, the weekly cost for heating and cooking is raised to 4s. The cost of our gas in Glasgow at present is 3s. 6d. per 1000 c.ft., so if each householder only required to consume a thousand c.ft. of gas in a week he could dispense with coal, and save much dirt and labour.

The question of great importance is, Can gas be made and distributed to the citizens at less cost than 3s. 6d. per 1000 c.ft., as I much fear 1000 c.ft. of gas per week would not prove sufficient for heating, lighting, and cooking? It is to be hoped that our Corporation in Glasgow, and in every large town in

our country, will do all they can to abolish the coal fires which defile our atmosphere, and render it, especially in winter, dangerous to inhale. I feel sure that it will be a day of public rejoicing, as well as one of public gratitude, when the directors and managers of the gas industry in this country manage to make it clear to the public that the use of gas, instead of raw coal, in every household will not only be conducive to public health, but will also save much in worry and labour.

Dr. Elizabeth C. Mudie (Glasgow) said that what they were suffering from, economically, physically, and psychologically, was the fact that they were a light-starved nation. They were a nation that produced rickets. People abroad called rickets the English disease; and it was due to the little ones not getting a sufficiency of light. Scotland, which was the most beautiful country in the world, had sufficient sunshine if men did not turn it off with a pall of man-made smoke. In her own home she had fourteen chimneys, and matters were so arranged that there was never a particle of smoke from any one of them. Some people said that gas fires were unhealthy; but, speaking from experience and from a knowledge acquired in her own profession, she had to characterize that statement as absolutely untrue. If gas was to forge ahead, then those in charge of the undertakings had to fall into line with the electrical competitors. The latter were more considerate in the matter of terms to good customers. When she had burned so many therms of gas as a consumer, why should she not get a rebate, similar to what the electrical people allowed?

Vote of Thanks.

Mr. J. W. Napier (Alloa), in moving a vote of thanks to those who had taken part in the conference at the afternoon session, remarked that there were a large number of housing schemes in Scotland where gas was used to the exclusion of electricity. There were housing schemes in Hamilton, Airdrie, St. Andrews, and Coatbridge which were in that position, thus proving conclusively that gas was accepted by local authorities as a satisfactory and essential fuel for heating, cooking, &c. Commenting on the point raised by Dr. Mudie, he could give that lady the assurance that in the course of a few days a Committee would be set up for the purpose of dealing with the price of gas. The idea was to charge for the commodity on a basis of equity, having regard to the quantity used and the value of the consumer to the gas undertaking itself. Personally he did feel that something was wanted in the matter of charging to confirm the opinion in the mind of the public that gas could be used cheaply and economically. A meeting of representatives of the gas industry would be held shortly in Glasgow, and he believed and hoped it would then be determined to set up a Committee to inquire into the principle and effectiveness of the application of a scale of charges to gas having regard to its uses by the consumer on a quantity basis.

Luncheon.

During an interval between the forenoon and afternoon sessions the delegates were entertained at luncheon in the Town Hall by the two local Gas Companies. Mr. T. Frew, Vice-Chairman of the Newton-on-Ayr Gas Company, presided.

Provost M'Allister (Troon), in proposing the toast of "The Gas Industry," said the industry was handicapped by having to work under Acts of Parliament that were obsolete, and those engaged in the industry should not rest until these Acts were either repealed or remodelled. Successive Governments, he contended, had fostered the electrical industry to the prejudice of the gas industry. The former, as a matter of fact, was desecrating a beautiful county like Ayr with hideous towers, which, he was sure, would ultimately be taken down, because of the outcry against them.

Mr. F. W. Goodenough, C.B.E., replied, and acknowledged the work done in arranging the conference by Messrs. McLusky, Fulton, and the Directors of the Ayr and Newton-on-Ayr Gas Companies.

Other toasts were "The Auld Toon o' Ayr," proposed by Mr. D. Fulton, and responded to by Provost Stewart; "The Visitors," proposed by Mr. J. M'Leod (Ayr), and acknowledged by Mr. J. W. McLusky.

The "M.A.N." Waterless Gasholder.

By J. H. Willis, A.M.I.Mech.E., Assoc.M.Inst.Gas E., of Messrs. Alexander Comley, Ltd. (Agents for Messrs. Clayton, Son, & Co., Ltd., and the Waterless Gasholder Company, Ltd.).

[Paper before the Midland Junior Gas Association, April 17.]

It may be known that, prior to the inception of the "M.A.N." type, various attempts had been made to evolve a gasholder dispensing with the conventional water basin. So far back as 1887, Adolph Pfeiffer, of Braunschweig, patented a gasholder without water tank and intended to work upon the piston principle; but so far as is known this never advanced beyond the theoretical stage. Among later attempts to solve the problem may be mentioned that of Aug. Klönne, of Dortmund, who took out a patent in 1908, but did not develop it. The same firm, however, have now a "dry" gasholder on the market, and a number of Klönne holders are stated to be operating on the Continent.

The "M.A.N." holder, introduced in 1914 by Maschinenfabrik Augsburg-Nürnberg A.G., was the first practical "waterless" holder. It was the invention of Dr. K. Jagschitz, and the world-wide adoption since accorded this type is a matter of common knowledge to the gas industry.

Principles of Design.

The essential constructive features of the "M.A.N." holder are now so well-known to gas engineers that no lengthy description is necessary. Briefly, the design introduces a vertical polygonal continuous shell, having its two ends closed respectively by a bottom plate and a roof—the latter slightly curved and fixed rigidly to the shell. A flat, movable piston is made to slide up and down inside the shell, rising and falling to the change in the contents of the holder; and a collapsible ladder or staircase gives access from the roof to the piston, whatever the position of the latter.

In view of an entirely new set of conditions being introduced, it became essential to depart from what so far had been considered the conventional system of gasholder construction. The shell, for instance, forms a permanent structure, retaining a fixed shape irrespective of whether the holder be full or empty. In certain conditions, therefore, the shell is unsupported internally by the gas pressure, having to withstand, however, external wind pressures. For this reason the shell has to be made self-supporting, a provision met in the most effective and economic manner by the polygonal construction.

The shell is stiffened by a number of uprights which are secured not only at the base by being fixed to the foundation ring, but also at the top by a rigid structure designed as a roof. Additional advantages of the roof include ease and convenience of access to the disc (or piston) and immunity from the effects of snow and rain. Rigidity of the structure is ensured by the specially-flanged shell plates, which in effect form a girder construction of very stiff and substantial section.

It is not the purpose of the writer, in this more or less general survey, to embark upon a lengthy dissertation involving pages of statical calculations; in general, it may be stated that in the "M.A.N." holder the whole structure is designed with a safety factor of 4, and to withstand a wind load of 40 lbs. per sq. ft. or more as may be required.

Having regard to the advent of another "dry" gasholder—*i.e.*, the Klönne type, already mentioned—in which the essential feature of the gas joint is an arrangement of superimposed packing rings of reinforced rubber composition, firmly pressed against the inner shell of the holder and fitted with automatic lubricators, you may expect a word—shall one say in defence of the "M.A.N." system?

In the "M.A.N." holder the seal is effected by means of an annular trough, which, in fact, forms the outer edge of the piston, and contains a quantity of prepared tar equal to not less than twice the gas pressure underneath. Contact with the inner surface of the shell is made by steel rubbing bars, adjusted and kept in position with counterweighted levers. The tar seal serves three distinct purposes:

(*a*) Complete prevention of gas leakage.
(*b*) Lubrication of the piston.
(*c*) Preservation of the interior surface of the shell.

The liquid seal is maintained by automatically-operated pumps situated around the base of the holder. As tar leaves the seal it flows down the inner shell to a common lute in the holder bottom, whence it is directed into external collecting tanks. These tanks are provided with float apparatus which in turn connects with the electrically-operated pumps. When a given quantity of tar has collected in the tank, the rising of the float automatically brings the pump into operation, and the tar is transferred to distributing tanks placed near the top of the holder, when it again reaches the relative section of the seal trough.

The tar pumps, it will be appreciated, operate intermittently, and the frequency of their action is to a large extent governed by the viscosity of the sealing liquid with which they are dealing. The cost of operating the pumps is, however, negligible. A waterless holder of 1 million c.ft. capacity operating in this

country at present consumes an average of 18 electricity units per week; while one of about 900,000 c.ft. capacity has recorded a current consumption so low as 218 units in a year.

The tar seal in practice has proved itself to be thoroughly reliable and satisfactory. Inquiries made in several quarters during the severe winter of 1928-29 showed that no trouble whatever was experienced. Not every gas engineer could say the same of his water-sealed holders.

With the regard to the principle embodied in the "M.A.N." seal, the introduction of fabric has been criticized. It should be realized, however, that the function of the seal fabric is merely to give that amount of flexibility which is desirable for the seal, and thus permit that member to perform its work effectively and continuously with the maximum possible length of life.

In this respect the sliding member differs essentially from the function of a piston ring. A piston ring—of whatever material it may be constructed—is fitted in that place where the maximum amount of wear is to be anticipated, and is placed in that position with the very object that it may be replaced cheaply and effectively. An engineer adopting a piston ring construction takes into consideration the necessity of periodical overhauling, and it must therefore be expected from the very outset that where a piston is fitted with a piston ring, of whatever form that may be most suitable, it will probably have to be dismantled at convenient or inconvenient —but certainly definite—periods during its life.

The essential difference between a liquid seal and a dry seal, it appears to the writer, is that whereas with a liquid seal you *may* replace the liquid itself (as the member subject to the most "wear and tear"), and that without putting the holder out of action, with a dry seal you are bound to consider the replacement of the piston ring at periods which will probably depend upon such factors as the frequency of piston travel, nature of gas stored, and conditions of working generally.

It is a fact that, although more than 200 "M.A.N." holders have been ordered during a period of some fifteen years, no seal fabric has ever yet been replaced. Nor is this surprising when one considers that this fabric (which perhaps may best be described as a "super" sailcloth) is not in contact with any rubbing or wearing surface, carries no direct weight, and is permanently steeped in the best of preservatives—an acid-free tar.

Now a word as to the sealing liquid itself—prepared tar. It will be obvious that, when one has to consider a wide range of gases of varying characteristics, much research and experience has contributed to the adoption of standard specifications for sealing tars. Broadly speaking, gases have been placed in two groups, and a suitable sealing liquid specified for each. In the case of coal gas or mixed coal and water gas, it has been found that the sealing tar will absorb a more or less fixed proportion of volatile fractions from the gas during the winter period; as the weather becomes warmer, these light fractions are returned to the gas. Thus the efficiency of the sealing tar remains unchanged. The tar used for such gases presents no undue difficulty of preparation, is relatively inexpensive, and in practice entirely satisfactory.

Construction and Erection.

(*a*) *Foundation.*—The absence of water renders the total weight of a waterless holder fractional as compared with the water-sealed type; and the larger the holder, the more marked is this difference in weight. For comparative purposes one may cite a holder of 5 million c.ft. capacity. If of the telescopic type, with water tank, aproximately 41,000 tons of water would be required for sealing purposes alone, apart from the weight of material in the tank and holder. Compared with this, a waterless holder of 5 million c.ft. capacity will weigh about 1250 tons.

This naturally simplifies foundation work to a degree, and moreover makes it possible to erect a waterless holder in a situation which might be regarded as impossible for the heavier water-sealed holder. Where piling is inevitable, it is less extensive and costly in the case of the waterless holder. For the same reason this type of holder has been largely adopted in mining districts. In the Ruhr district of Germany, for instance, forty or more of these holders have been erected within an area of roughly 35 miles square on ground which, for the most part, is literally honeycombed with mines. Should the holder show a tendency to tilt owing to ground subsidence, the comparative lightness of the structure enables it to be restored to its correct position with the minimum of trouble, time, and expense. Where such a contingency has to be reckoned with, special provision is made for placing jacks under the holder and thus facilitating the operation.

When ground space is limited, it has been found advantageous to erect waterless holders upon elevated foundations, allowing useful miscellaneous storage space under the holder. Alternatively, the holder may be adapted to existing underground tanks. In such cases the holder is erected over the tank upon a concrete slab or radial girder foundation; the tank remaining available for storage of tar, liquor, &c.

Advantage has been taken of these facilities in the case of some of the waterless holders now erected or in progress in this country.

The relation of diameter to height in the case of the waterless holder is about 1·0 to 1·6. It will thus be seen that less ground space is required for a given capacity than in the case of the water-sealed holder. One waterless holder of 4,250,000 c.ft. capacity now being erected in this country over an existing underground tank replaces an old telescopic holder of 800,000 c.ft. capacity; while in another and similar case, the dismantling of an old holder of 876,000 c.ft. capacity has enabled a 3 million c.ft. waterless holder to be erected over the existing tank without additional ground space.

(*b*) *Design.*—Accuracy of design and construction are of primary importance. The machined inside flange of the built-up columns (channels or **H**-section, according to size of holder) carries the shell plates, and likewise acts as the guide face for the piston rollers. At two diametrically opposite points of the piston, special tangential guides are fitted. Thus any possible tendency of the piston to "swing" is provided against.

(*c*) *Erection.*—Careful and exact erection of the holder is an essential. The method of erecting waterless holders may be briefly recapitulated for those who may not be familiar with the system employed.

The bottom plating, roof, and piston are completed practically at ground level, with the lower tiers of shell plates. The roof and piston are then connected to each other and, together with the special erection tackle and tools, raised by the application of compressed air under the piston. This operation is repeated as each succeeding tier of side plates is completed. The air pressure, of course, is released between each lift, when a specially designed fitting on each column enables the piston to be adequately supported. Additional lengths of column are fixed as required.

It will be realized, therefore, that the piston is used as a jig for the erection of the holder; and it follows that the work must necessarily be accurate in order to permit of the raising of the piston from time to time as erection proceeds.

Advantages.

The benefits resulting from the use of a waterless holder may vary according to individual conditions; but it cannot be questioned that it offers advantages not to be obtained with the water-sealed holder of telescopic construction.

To the majority of gas engineers, at all events, constant pressure is the feature which probably makes the greatest appeal. It is easy to appreciate that the advantage of a full pressure from the holder, irrespective of the quantity of gas therein, is indeed a boon; especially where boosting plant is not available to restore the drop of pressure consequent upon the descent of the lifts of an ordinary telescopic holder. This distinction between effective capacity and purely nominal capacity is of obvious importance.

Although the pressure, taken upon the piston, remains absolutely constant, it should be made clear that some slight variation may occur in the pressure at the gas outlet, due to altitude effect. This, of course, is in direct proportion to the specific gravity of the gas stored, and is unavoidable where the gas has a specific gravity of (say) 0·45 as compared with air. The variation is so small, however, as to be negligible. It is seldom that the working of a waterless holder entails a full travel of the piston from top to bottom or *vice versa*; but it may be taken generally that where a certain minimum pressure is specified for a waterless holder storing coal gas—that is, with the piston at the top position—a slightly increased pressure will be thrown at the gas outlet as the piston nears the bottom and the volume of air above the piston increases in relation to the gas stored underneath it.

Absence of water benefits the user of the waterless holder in several directions. Its effect in regard to the load upon foundations has already been referred to. More important, perhaps, are the elimination of water-freezing risks and the inability of gas to pick up additional moisture while stored in the holder. Charts recording collections of condensate from street syphons show that a really surprising reduction has followed the installation of a waterless holder. Perhaps not so surprising after all, when one considers the obvious tendency of gas to absorb moisture when stored over a large sheet of water in hot weather.

It is not suggested that the waterless holder is an alternative to the gas-drying processes which have latterly found favour with many gas engineers; but it is an undoubted fact that gas goes forward from a waterless holder in an appreciably drier condition than from a water-sealed holder, and this must be of some consequence to gas undertakings in relation to the effect upon mains and services, labour costs involved in the collection of condensate and (in many cases) the difficulty of disposing of the effluent. This latter difficulty will naturally be intensified when the need arises for emptying a gasholder tank containing some millions of gallons of foul water.

Increasing the Capacity.

The advantage of being able to increase the capacity of a gasholder without putting it out of commission will interest many gas engineers—particularly those concerned with the smaller and medium-sized works, since it enables a gas undertaking to limit expenditure to the immediate requirements of additional storage, with a view to extension at a later date.

Many of the "M.A.N." holders now operating have been prepared for future extension, and one of them which the writer saw on the Continent had been recently doubled in capacity—from 700,000 to 1,400,000 c.ft. The whole operation occupied about two months, the holder remaining in commission throughout.

Serious consideration has lately been devoted to the subject of gasholder painting, and various recommendations have been made with a view to improving the appearance of the ordinary gasholder. Such a movement is opportune and well-conceived, for one feels that hitherto there has been much to justify the reproach levelled at gasholders generally in the matter of their appearance. Artistic painting, conforming as far as possible to the surroundings, can do much to improve the æsthetic effect of a structure which, at the best, cannot be "a thing of beauty and a joy for ever."

In the case of the waterless holder, almost any colour scheme may be carried out—preferably with the galleries and stairways in a colour different to that used for the shell. Its immunity from the disfigurement caused by partial immersion in water from time to time ensures that the appearance of the external painting remains uniform, while, of course, the necessity for repainting arises less frequently than with the ordinary type of holder.

Brief mention may be made in passing of the facilities afforded for advertising on the sides of the waterless holder. Full advantage of this has been taken by several owners of waterless holders, and probably many of you have seen reproduced—both at the recent British Industries Fair in this City, and in Trade Journals—the photograph of a 3-million c.ft. waterless holder at Vancouver which advertises "Gas" in a very striking manner.

It may be interesting to mention, also, that an 8-million c.ft. waterless holder recently completed at Southall is to be utilized for aircraft directional purposes by the erection of a powerful beacon on the roof. A similar supplementary purpose is served by the world's largest gasholder—a waterless of 20 million c.ft. capacity at Chicago. It is to be anticipated that the development of commercial airways may lead to an extension of this idea.

Upkeep and Maintenance.

This aspect has to some extent been dealt with earlier in the paper—for instance, in regard to painting and cost of current for pumps—but some further reference to the matter is desirable.

First let us take the question of supervision. It has been stated in some directions that the waterless gasholder needs contant supervision, the basis of the argument being, apparently, that it is "a piece of machinery." Experience does not prove that this contention can be substantiated. Any gasholder *should* be looked after, and ordinary prudence suggests that a waterless holder needs reasonable attention and regular inspection of working parts. This, however, need not entail extra cost in additional labour on the works.

So far as external inspection goes, this is practically confined to the pumps which are placed around the bottom of the holder. The runs of each pump are recorded by an indicator, and it is an extremely simple matter to take the indicator readings as often as desired, to ensure that each pump is doing its work properly. To bring any pump into instant operation, moreover, is the work of a moment. The pumps are of simple construction; the wear and tear of this equipment and the attention required to maintain correct adjustment of the automatic trip gear are really negligible. Incidentally, every working pump is duplicated in case of breakdown, and should the whole supply of current fail owing to breakdown at the source of supply, a reserve of sealing liquid is available in the tanks fitted at the top of the holder.

Internal inspection of the holder entails, chiefly, the occasional lubrication of the guide rollers and the taking of "dips" to test the depth of liquid in the seal at various points. This may be done just as frequently as the responsible official desires. Some consider a weekly inspection of the interior to be sufficient; few will think it necessary to carry out the inspection more than twice per week—at all events, after the holder has been in commission some little time and has proved itself. These and other minor details of attention may well be incorporated in the ordinary works routine. "Constant supervision," therefore, is an exaggerated term; *reasonable* supervision, by all means.

Replenishment of the sealing tar will depend to some extent upon local working conditions, but experience to date has shown that, at any rate for several years, no sealing tar need be added or replaced. Assuming, however, that the whole of the sealing liquid might be replaced within twenty years, the cost of maintenance in this direction would be small.

Fabric Joint.

If any anxiety is felt as to the condition of the fabric joint in the seal after several years' service, the inspection of this member is a comparatively simple matter, involving the isolation of the holder for a very short time only. In a similar manner a water-sealed holder would need to be out of commission in order that any extensive examination might be made. Should it be desired to renew the seal fabric, probably a fortnight at the most would be necessary—not an unreasonable period as compared with the time required for (say) renewing the cup plate on one lift of a telescopic holder.

Distant control, where desired, is a very practical proposition for the waterless holder. It is possible by the installation of simple instruments to check such points as capacity, pressure, pump runs, &c., from the executive office or any convenient point. Although in the majority of cases this would probably be considered a luxury, in others it might solve a very real difficulty in an ideal manner.

Comparative Costs.

How does the waterless holder compare in first cost with a spiral or column-guided holder? The writer purposely refrains from attempting any basis of comparison which may, later, be held to be misleading. It is, in fact, impracticable to state with any degree of certainty that a waterless holder of such-and-such a capacity will be cheaper than a water-sealed holder of the same size—or *vice versa*. With gasholders, as with other commodities, there is nowadays no stability of prices which enables a definite comparison to be made, and in the writer's considered opinion it is a mistake to attempt a generalization upon the point. In most cases—particularly with the larger sizes—the waterless holder should show a saving in foundation costs; but although first cost of a holder is undoubtedly a serious consideration, it is not the only one. For instance, if you consider the question of peak load capacity under modern conditions of less than 24 hours' storage, the net capacity of a waterless holder of given size may be computed at not less than twice that of the telescopic type.

Whether in any particular instance the price for a waterless holder turns out to be more or less than that of other types, the logical procedure is to "capitalize the advantages."

Mr. F. L. Chaloner, Director of the Waterless Gasholder Company, then described many of the features of waterless gas holders.

Discussion.

Mr. A. R. Mythill (President), in proposing a vote of thanks to Mr. Willis, said the paper had been a very welcome one, as it dealt with a subject which was new to the majority of those present. He expressed interest in the quality of tar used in the seal, and asked if the tar deteriorated after being in use for some time.

Mr. W. L. S. Spinks (Birmingham), who seconded the vote of thanks, said the construction of the holder, and the fact that it did not depend on water for sealing, seemed to have overcome the question of corrosion in gasholders, and had also, to a large extent, answered the question as to how to keep the gas dry.

Mr. Willis, replying to various questions asked by members, said that the tar used in the gasholders was previously prepared in Germany, but was now being made in this country. It was a coal tar with a certain percentage of light oils added, varying according to the conditions to be met. If the holder was used under normal conditions, they found that very little deterioration took place in the quality of the tar. He had had no actual experience with other types of waterless holders, but, in his opinion, there was a great future for the waterless type, and he thought very few holders of the old type of more than a million c.ft. capacity would be built in the future. The fabric of the seal, which was previously manufactured abroad, was now prepared in this country. The fabric was particularly strong, and they had not had to renew in the whole of their fifteen years' experience. The fact that there need be no internal corrosion was one of the important advantages of this type of holder. If the piston was raised above a certain height, the gas would escape through relief pipes. The recording of the position of the piston in holders situated some distance from the works could be done electrically, as in the ordinary type of telescopic holder. In concluding, Mr. Willis thanked Mr. Chaloner and Mr. S. Langford, Engineer to the Waterless Gasholder Company, for the support and help given to him in his lecture.

Cookery Demonstrations at Bradford.—The Bradford Corporation Gas Committee are the organizers of the cookery theatre which has been set up at the Ideal Homes Exhibition now being held at the Olympia Hall, Bradford, and demonstrations are being given there by Miss E. K. Eason, N.S.T.C. On May 5 Miss Eason gave special demonstrations in the theatre on the making of the various dishes which are concerned in the competitions in connection with the exhibition, and for which valuable prizes are offered in bread-making, lunch-cake, currant teacake, and apple pasty. There are many consolation prizes and a scheme of prizes on a plan of coloured discs.

Coke Oven Gas in Leeds.—A Leeds Gas Department subcommittee is making inquiries into possibilities of utilizing surplus gas from coke oven plants in West Yorkshire. The Yorkshire Coking and Chemical Company, Ltd., have offered to supply a guaranteed daily minimum of 2¾ million c.ft. of unpurified gas from the coke ovens at Glasshoughton collieries, but after comparing this offer and the cost of purifying, as against the cost of gas manufacture at Leeds, the Committee do not recommend its acceptance. An intimation has been received from Donald Bagley, Ltd. (London), that that firm are contemplating the erection of coke ovens near Leeds, and would guarantee a surplus of three to four millions of 490 B.Th.U. gas daily. The firm are being asked for further details.

Register of Patents.

Oven Thermostats.—No. 327,138.

R. & A. MAIN, LTD., and WORTLEY, G. W., both of Falkirk.

No. 37,867; Dec. 21, 1928.

An object of this invention is to provide a thermostat, although situated in the side of the oven, the indicator of which may be viewed from the front of the oven. According to the invention, a thermostatically controlled valve device comprises an adjustable member which by reason of its adjustment varies the space between the valve and a valve-seating, which adjustable member, as to a part or whole, is movable for the purpose of adjustment in the direction of movement of the thermally expansible element or of the valve, and means for indicating the adjusting movement of the adjustable member, which means extend transversely to the direction of movement of the thermally expansible element. Preferably, the thermally expansible element, the adjustable member and the valve, or valve-seating are so disposed that their paths of movement are in line. Preferably, the indicating means is gear-connected to the means for effecting the aforesaid movement of the adjustable member.

A still further feature of the invention consists in forming an indicating scale on the face of the gear-wheel which is secured to the indicating means, and in securing an apertured plate to the body of the device so as to mask the indicating scale except for that portion of it beneath the aperture in the plate.

[Patent No. 327,144 is a modification of this idea.]

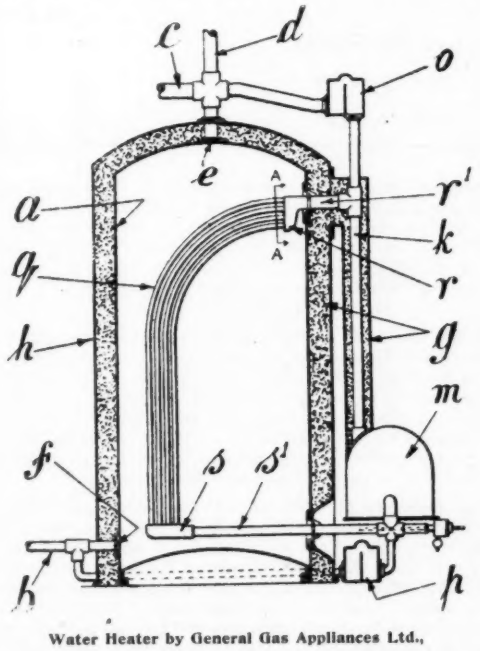
Gas Water Heaters.—No. 327,412.

GENERAL GAS APPLIANCES, LTD., and COLEMAN, F. S., both of Manchester.

No. 35,271; Nov. 30, 1928.

This invention relates to the indirect type of heating systems in which a separate circulation circuit is provided for the boiler or heater forming a heat interchanger. The indirect system, state the patentees, has the advantage that the "furring" in the heater coils is reduced to a minimum, and no claim is made to such arrangements *per se*. The accompanying drawing is a diagrammatic section showing one method of applying the invention to an existing cylinder.

As shown, the apparatus comprises a cylinder *a* constructed so as to be capable of being fitted to the ordinary arrangement of piping



Water Heater by General Gas Appliances Ltd.,

for a directly heated cylinder—namely, the cold supply pipe *b* and the draw-off and vent or expansion pipes *c* and *d*, which latter two pipes join immediately above the cylinder. The cylinder has the usual central upper connection *e* and lower side connection *f* for such pipes, and is lagged, the lagging *g* being retained by an outer casing *h*. Within the cylinder is arranged the heat interchanger *q* the ends of which pass through into the lagging, and the upper end connecting into a riser pipe *k* from the top of a boiler, and the lower end extending downwardly as a fall pipe and connecting to the bottom of the boiler. The boiler *m* is adapted to be heated by a thermostatically controlled gas ring or burner (not shown), the pipes so connected providing a thermosyphonic circulating system, the thermostat being arranged in the fall pipe of the system to provide automatic control for the gas ring or burner. The upper end of the "riser" pipe *k* is connected through an air-locked trap *o* to the upper connection *e* for the cylinder, and hence to the expansion pipe *d* of the main system. A fluid maintenance connection for the indirect system is taken from the lower part of the boiler *m* to the lower connection *f* or cold supply pipe *b* for the cylinder through an air-locked trap *p*.

The pressure in the indirect system is therefore the same as that in the cylinder as the water flows over the weir in the lower trap, fills up the coils and piping, expelling the air from the upper trap until the pressure on the surfaces of the liquids in the traps are balanced. Thus the level of the water in the riser pipe *k* of the indirect system will be the same amount below the level of the water in the cylinder side of the upper trap *o*, as the differences in level of the water on the two sides of the lower trap *p*, such difference always being maintained owing to the air lock.

In operation, therefore, the two traps *o* and *p* effectively isolate water in the indirect heating circuit from the water in the cylinder or main system, the same water being retained in the boiler circulation except for that which enters from time to time to make up for evaporation or any other loss. The boiler is therefor provided with an expansion and supply system direct from the cylinder or main system and at the same time its circulation is equally isolated from the main system as if it had the usual separate expansion and supply system, and similarly the boiler deposits are limited to that which comes from the water admitted to and retained in such circulation.

In the example of the invention as shown, the parts of the heat interchanger are constructed so as to enable an indirect system to be applied to an existing cylinder as used in a direct heating system. Holes are made in the side of the cylinder at the upper and lower ends one above the other, through the upper one of which is inserted the heat interchanger, the ends of which when in position project through couplings, which may be fitted and secured from without. The interchanger consists of a nest of tubes *q* coupled at their ends by headers *r* and *s*, the upper header *r* being formed with a tubular extension r^1, and the lower header *s* having a tube s^1 suitable for use with the above-mentioned flange or coupling for the side of the cylinder. The tubes are conveniently bent part circular longitudinally, to facilitate fitting. To the outside ends of the interchanger tube is connected the boiler *m*, preferably by lagged tubes, the thermostat control for the gas burner *n* being positioned in the tube s^1. The separate circulation system thus provided is connected as before to the top and bottom connections of the cylinder through air-locked traps *o* and *p*.

Gas Valves.—No. 327,308.

FALKNER, A. J., of Dunmow.

No. 12,248; April 19, 1929.

This invention relates to gas valves of the kind wherein the plug thereof when operated is adapted to regulate an injector arranged co-axially of it.

Valves of the above type, states the patentee, may be broadly described as comprising a body part within which are located the plug and the co-axial injector needle. The body part of this type of valve generally has a side opening for the inlet of gas, and the plug has a corresponding opening and a hollow bore communicating therewith leading to the injector. As the plug opening is turned more or less or out of register with the body opening, the rate of flow of the gas is altered or stopped, and the needle is correspondingly shifted with respect to the injector nipple by means of a cam.

A distinctive feature of the present invention consists in including in a valve of the above type a device adapted to vary the size of the primary air inlet or inlets as the plug is operated, so that three control operations are performed simultaneously.

In one form of the invention the injector end of the plug is provided with a semi-cylindrical prolongation extending beyond the injector, and the valve body has a part of corresponding shape but of slightly larger radius concentric with the prolongation. When the valve is "off," the two semi-cylindrical parts are so arranged that they lie diametrically opposite each other. When the plug is turned to open the valve, the prolongation turns with it and is received by the part on the body, and the primary air inlet is thereby opened by an amount corresponding to the amount of turning of the plug, and which corresponds to the effective size of the injector orifice.

The stem of the injector needle may extend through the plug and beyond the outer end thereof, and be adjustably fixed to a handle-rotated sleeve on which is a cam face. The sleeve is slidably, but not rotatably, connected with the plug, while the cam face bears against a roller surface carried by the valve body. Thus, when the handle is turned, the plug is operated also, while the sleeve and needle are given an axial movement due to the cam and roller.

Applications for Patents.

BALLINGALL, J. M.—"Manufacture of water gas." No. 12,893.
DOCKING, A.—"Gas producers." No. 12,825.
GREENWOOD, J.—"Gas burner." No. 12,344.
KENT, A. T.—"Doors of carbonizing chambers." No. 12,683.
KOPPERS COMPANY.—"Coking retort ovens." No. 12,689.
MACE, B. E.—"Gas meters." No. 12,901.
MILLS, G.—"Gas pressure regulators." No. 12,419.
SAUNDERS, H. D. E.—"Thermostatic controlling devices." No. 12,814.
SCHMIDT, F. R.—"Gas and water valves." No. 12,668.
STREBELWERK GES.—"Geysers." No. 12,448.

Board of Trade Inquiry at Colchester.

On Wednesday, April 30, Mr. J. F. Ronca, Director of Gas Administration, held a Board of Trade inquiry at the Oddfellows' Hall, George Street, Colchester, regarding an application of the Colchester Gas Company for a Special Order under the Gas Undertakings Acts, 1920 and 1929, to enable the Company to erect a gasholder on a site at Rowhedge, near Colchester.

Mr. O. Thompson Smith, Solicitor (and a Director of the Colchester Gas Company), represented the Company; and four objectors appeared in person.

The Director said he had before him a list of names of a number of objectors.

Mr. Thompson Smith, in explaining the necessity for the proposals, said the Colchester Gas Company had supplied the village of Rowhedge, some four or five miles away, for about twenty years, and during that time there had been a great increase in the consumption of gas in Rowhedge, all the more so because a village called Old Heath on the way to Rowhedge was also supplied by the same mains. There had been considerable building in Rowhedge, and gas cookers had become very popular, and the Company had fixed many there. The result was that there was a certain difficulty in maintaining an adequate and even pressure during the peak loads. The Company were advised by their Engineer that the most efficient method of overcoming the difficulties was to instal a small district gasholder to be filled at periods of light load, so as to maintain an even pressure in the Rowhedge mains. This would assure an efficient supply at all times. If the holder was erected at the end of the village, as proposed, the mains would be fed from Colchester from the one end, and from the holder from the other.

Having been advised that this was the best method of giving a proper supply, the next important question was as to site; and the Directors and Management of the Company took the greatest care to select a site to which the least objection could be made from many points of view. Only three sites were possible. One of them was near an old brewery, in High Street, but that was rejected because it was found that the holder would be near several houses, and would shut out the light from some of them, and the expense was also almost prohibitive. The next site was near the pumping station. This would have been a very good site, but they could not secure it. The third site was the piece of land scheduled, and this was found to possess distinct advantages, and had been provisionally acquired. It occupied an inconspicuous position at the back of the village and behind the houses, and, moreover, was next to the water tower and on the site of an old gravel pit now used as a refuse dump. The holder there could only be seen from the back of two or three houses, and the back window of the nearest house would be thirty yards away. The structure would be about 35 ft. from the ground, and 6 ft. would be submerged in the gravel pit.

As to the objectors, he could not conceive that it would be possible to find any spot in Rowhedge where there would not be some ground for objection by some person. They believed the best place had been chosen, and that if they had to cause inconvenience it would cause inconvenience to the least number of persons. At present the people concerned, on looking out of their windows, looked on to the water tower. Also, if they had this site they would be doing away with the refuse dump.

There were three grounds of objection. One was that the gasholder would be too close to adjoining property and would cause depreciation in value. If the objectors seriously thought this, he considered that they would have been present to support their objection. Then it was objected that the holder would be too near the water supply, but there need be no fear as to this. The engineer would say that it could not possibly affect the water supply, and in any case the proper authority to object was the local authority. Another ground of objection was that other sites were available. The Company would like to know of them. He did not know of any other land round there which was available. Notice of the proposal had to be given to the local authority, and if there was any serious objection it was for them to put in an objection; but they had taken no notice whatever of the matter.

Mr. *William Walter Townsend*, Engineer and General Manager of the Company, in confirming the statement of Mr. Thompson Smith, said that the village of Rowhedge had been supplied with gas by the Colchester Gas Company for more than twenty years, and in the Colchester Gas Act of 1916 Parliamentary powers were obtained for a wide area surrounding Colchester and including this village. The site proposed for the holder had distinct advantages.

One of the objectors, Mr. G. Pearman, the owner of a cottage, suggested in questions to the witness that there were alternative sites available, that his property would be depreciated in value, that the roadway was not a right-of-way, and that the traffic would shake his property to pieces. He also asked the position regarding the insurance on his property.

Witness: That will not be affected at all.

Another objector (Mrs. Pearman) asked whether, in case of an accident, the Company would be responsible for all damage done to the property.

The Director: I do not think he can answer that question, because it will depend on circumstances.

The inquiry then concluded, and the Director visited the locality.

Gas Acts (1920 and 1929) Orders.

SPECIAL ORDER.

Gloucester Gaslight Company.

To authorize the use of scheduled land for gas purposes, to empower the Company to raise additional capital, &c.

SALE OF STOCK BY TENDER.

SOUTHAMPTON GAS COMPANY.

SALE BY TENDER.

£100,000

5½ PER CENT. PREFERENCE STOCK.

Minimum Price of Issue, £97 10s. 0d. per £100 Stock.

TENDERS are invited, not later than Monday, 19th May, 1930, for the above in amounts of not less than £50 Stock in multiples of £10.

The Stock will be registered in the Company's books in the names of the Purchasers or their Nominees, free of expense, and will be transferable by Deed in the usual way in amounts and multiples of £10.

Dividends are paid on the 1st March and 1st September in each year, and one month's Dividend on this issue to the 30th June will be paid on the 1st September, 1930.

A Brokerage of 10s. 0d. per £100 Stock will be paid on all Stock allotted on applications bearing the stamp or name of a Bank or Broker.

Forms of Tender can be obtained from the undersigned.

By Order of the Directors,

H. Runham,

Secretary.

66, Above Bar Street,

Southampton,

April 22, 1930.

Hampton Court Stock Issue.—As will be seen from our advertisement columns, Messrs. A. & W. Richards, of 37, Walbrook, E.C. 4, are offering for sale by tender, on behalf of the Directors of the Hampton Court Gas Company, £40,000 5 p.ct. redeemable debenture stock, to be redeemed at par on July 1, 1950. Tenders for this issue must be received not later than 11 o'clock on Tuesday, May 20.

Cardiff Gas Staff Benefits Scheme.—Members of the Cardiff Gas Company Employees' Approved Society on April 31 decided to increase sick benefit from 15s. to £1 per week; disablement benefit from 7s. 6d. to 10s. per week; and maternity benefit from £2 to £2 10s. The non-cash benefits such as dental benefits were also increased. The Chairman, Mr. P. V. Price, was presented with a canteen of cutlery in appreciation of his services to the Association since its inception.

Price Reduction at Ulverston.—At the annual meeting of the Ulverston Urban District Council, at Ulverston, on Wednesday, April 23, Mr. Warhurst moved the adoption of the Gas, Water, and Fire Brigade Committee's report, which showed that the estimated profit for the year on gas-works account was £1200, out of which it was recommended that £700 should be transferred to district fund account and the balance carried forward as a credit balance. The Committee also recommended that the present price of gas of 3s. 2d. per 1000 c.ft. be reduced by 2d. per 1000 c.ft., which, under the new system of charging per therm, will mean 7·2d. per therm instead of 7·6d. per therm, and also that large consumers, in addition to the existing discounts to consumers of 100,000 c.ft. and over, have the following further discounts: Exceeding 150,000 and not exceeding 200,000 c.ft., 4d. per 1000 c.ft. or 0·80d. per therm; exceeding 200,000 c.ft. and not exceeding 250,000 c.ft., 5d. or 1d. per therm; exceeding 250,000 c.ft., 6d. per 1000 c.ft. or 1·2d. per therm. Mr. Warhurst gave an interesting review of the progress of the gas undertaking during the ten years he had been Chairman of the Committee, and he paid a warm tribute of appreciation of the services rendered by the Manager, Mr. Hague, and the works staff. The recommendations were unanimously approved.

STOCK AND SHARE LIST.

[For Stock Market Report, see earlier pages.]

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. May 2.	Rise or Fall on Week.	Transactions Lowest and Highest Prices During the Week.
£			% p.a.	% p.a				
171,978	Stk.	Feb. 6	5	5	Aldershot 5 p.c. max. C. .	73—78	..	75—76
522,992	,,	,,	4	4	Do. 4 p.c. Pref. . .	70—73	..	71—72
1,551,868	,,	Apl. 3	7⅞	7⅞	Alliance & Dublin Ord. . .	93—96	+1	94½—96
374,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb. . . .	60—63	..	..
522,655	,,	Mar. 6	7	7	Barnet Ord. 7 p.c. . . .	109—112	..	..
300,000	1	Apl. 24	1/4½	1/7½	Bombay, Ltd.	16/—18/-*	..	16/6—18/-
174,500	10	Mar. 6	9	9	Bournemouth 5 p.c. . . .	13½—14½	..	..
500,050	10	,,	7	7	Do. B 7 p.c. . . .	12½—12¾	..	..
439,160	10	,,	6	6	Do. Pref. 6 p.c. .	10¾—11½	..	11
50,000	Stk.	Dec. 19	3	3	Do. 3 p.c. Deb. .	55—58	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb. .	74—77	..	..
357,900	,,	Mar. 20	7¼	7½	Brighton & Hove 6 p.c. Con.	113—116	..	..
371,880	,,	,,	6⅞	6⅞	Do. 5 p.c. Con.	100—103	..	..
1,287,500	,,	Feb. 20	5	5	Bristol 5 p.c. max.	87½—88½*a*	..	..
855,000	,,	Apl. 3	7	8	British Ord.	110—115	..	..
100,000	,,	Dec. 19	7	7	Do. 7 p.c. Pref.	115—120	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. .	69—71	..	..
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. .	92—95	..	..
100,000	,,	Jan. 9	5	5	Cambridge 5 p.c. Deb. . .	92—95	+1	..
100,000	10	Dec. 5	8	6	Cape Town, Ltd.	8½—9½	..	9¼
100,000	10	Apl. 24	4½	4½	Do. 4½ p.c. Pref. . .	6¼—7¼*	..	..
150,000	Stk.	Dec. 19	4½	4½	Do. 4½ p.c. Deb. . .	69—74	..	..
626,860	,,	Feb. 20	6	6	Cardiff Con. Ord.	96—99	..	..
237,860	,,	Jan. 9	7½	7½	Do. 7½ p.c. Red. Deb. .	98—101	..	..
157,150	,,	Feb. 20	5	6½	Chester 5 p.c. Ord. . . .	87½—92½*b*	..	..
98,936	1	Oct. 10	†2/-	†2/-	Colombo, Ltd. Ord. . . .	34/—36/-	..	..
24,495	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. . .	19/—21/-	..	..
375,402	1	Apl. 3	1/9⅝	1/9⅝	Colonial Gas Assn. Ld. Ord	20/—22/-	..	..
187,848	1	,,	1/7½	1/7½	Do. 8 p.c. Pref.	19/—21/-	..	20/9—21/-
2,073,280	Stk.	Feb. 20	5	7	Commercial Ord.	89—92	..	91—92
475,000	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	57—60	..	..
787,560	,,	Feb. 20	7	7	Croydon sliding scale. . .	105—108	..	..
453,100	,,	,,	5	5	Do. max. div. . . .	83—86	..	..
542,270	,,	Mar. 6	7	10	Derby Con.	1'5—125*e*	..	..
55,000	,,	Dec. 19	4	4	Do. Deb.	67—70*e*	..	..
209,000	,,	Mar. 6	5	5	East Hull Ord. 5 p.c. . . .	71—73	..	71½
1,002,180	10	Mar. 20	†4	†7	European, Ltd.	13½—14½	−1	13¾—15
18,629,125	Stk.	Feb. 20	5½	5½	Gas Light & Coke 4 p.c. Ord.	18/9—19/3*f*	..	18/9—19/3
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max. . . .	63—65	..	64½—65
4,157,020	,,	,,	4	4	Do. 4 p.c. Con. Pref. . .	77—80	..	77⅛—78⅜
5,602,620	,,	Dec. 19	3	3	Do. 3 p.c. Con. Deb. . .	58—61	..	..
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. . .	98—101	..	..
82,500	,,	Mar. 20	7	7	Hastings & St. L. 5 p.c. Conv.	96—101	..	9?½
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	78—83	..	..
70,600	10	Oct. 10	†10	†10	Hongkong & China, Ltd. .	13¾—14¾	..	..
213,200	Stk.	Mar. 6	6	6	Hornsey Con. 3½ p.c. . . .	90—93	..	..
1,976,000	,,	Nov. 1	20	10	Imperial Continental Cap. .	390—410	−10	395—417
223,130	,,	Feb. 6	3½	3½	Do. 3½ p.c. Red. Deb.	75—85	..	..
235,242	,,	Mar. 20	8½	8½	Lea Bridge 5 p.c. Ord. . .	112—115	..	..
2,145,907	,,	Feb. 20	6	6	Liverpool 5 p.c. Ord. . . .	90¾—91½*b*	..	..
600,000	,,	Mar. 20	7	7	Do. 7 p.c. Red. Pref. .	100—102*b*	..	..
165,736	,,	Feb. 20	9	8	Maidstone 5 p.c. Cap. . .	119—124	..	..
63,480	,,	Dec. 19	3	3	Do. 3 p.c. Deb. . .	52—55	..	..
75,000	5	Dec. 5	†10	†10	Malta & Mediterranean . . Metrop'itan (of Melbourne)	5½—6	..	..
392,000	—	Apl. 1	5½	5½	5½ p.c. Red. Deb. . . .	90—93	..	..
541,920	Stk.	Nov. 21	†9	†6	Montevideo, Ltd.	107—112	..	..
2,061,315	,,	Feb. 20	5	5½	Newcastle & Gateshead Con.	15/9—16/3*df*	..	..
682,856	,,	,,	4	4	Do. 4 p.c. Pref. .	70—71*d*	..	..
691,705	,,	Dec. 19	3½	3½	Do. 3½ p.c. Deb. .	66½—67½*d*	..	..
169,940	,,	Mar. 6	7½	7½	North Middlesex 6 p.c. Con.	109—114	..	..
396,160	,,	Feb. 6	5	5	Northampton 5 p.c. max. .	74—77	..	..
300,000	,,	Apl. 24	9	7	Oriental, Ltd.	106—111*	..	108
60,000	5	13 My., '15	—	—	Ottoman	0—⅜	..	..
205,162	Stk.	Jan. 9	8	8	Plym'th & Stonehouse 5 p.c.	107—110	..	..
424,416	,,	Feb. 20	8	8	Portsm'th Con. Stk. 4 p.c. Std	110—115	..	113
241,446	,,	,,	5	5	Do. 5 p.c. max. . .	78—81	..	79½
2,999,464	1	June 27	—	‡5	Primitiva Ord.	28/—30/-	..	..
186,000	100	Dec. 2	4	4	Do. 4 p.c. Red. Deb. . .	92—95	..	..
677,837	Stk.	Jan. 23	4	4	Do. 4 p.c. Red. Deb. 1911	81—84	..	..
371,496	,,	Dec. 19	4	4	Do. 4 p.c. Cons. Deb.	81—84	..	82½
150,000	10	Apl. 3	6	6	San Paulo 6 p.c. Pref. . .	8½—9	..	..
1,736,368	Stk.	Mar. 20	6½	6½	Sheffield Cons.	102—104*e*	..	..
95,000	,,	Jan. 9	4	4	Do. 4 p.c. Deb.	76—78*e*	..	..
90,000	10	June 13	†4	‡4	South African	4—6	..	..
6,709,895	Stk.	Feb. 20	5	7½	South Met. Ord.	102—104	+1	102—103½
500,000	,,	,,	6	6	Do. 6 p.c. Irred. Pf.	107—110	..	109—110
1,895,445	,,	Jan. 9	3	3	Do. 3 p.c. Deb. . .	58—61	..	..
734,000	,,	Mar. 6	6½	6½	Do. 6½ p.c. Red. Db.	99—101	..	..
91,500	,,	Mar. 20	8½	8½	South Shields Con. . . .	105½—107½*d*	..	..
1,545,795	,,	Feb. 20	6½	6½	South Suburban Ord. 5 p.c.	100—103	..	..
468,827	,,	Dec. 19	5	5	Do. 5 p.c. Deb.	92—95	..	..
647,740	,,	Feb. 20	5	5	Southampton Ord. 5 p.c. max.	76—79	..	..
121,275	,,	Dec. 19	4	4	Do. 4 p.c. Deb.	72—75	..	..
179,014	,,	Feb. 20	8	8	Sutton Ord.	113—116	..	..
67,828	,,	Jan. 9	5	5	Do. 5 p.c. Deb. . . .	91—94	..	..
250,000	,,	Mar. 6	7	7	Swansea 7 p.c. Red. Pref. .	98—100	..	..
200,000	,,	Dec. 19	6½	6½	Do. 6½ p.c. Red. Deb. .	99—101	..	99½—100
1,076,490	,,	Mar. 6	6⅝	6⅝	Tottenham District Ord. .	101—105	..	..
150,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. . .	95—98	..	..
199,035	,,	Dec. 5	4	4	Do. 4 p.c. Deb. . .	73—76	..	74
182,880	10	30 Dec., '12	—	—	Tuscan, Ltd.	3⅜—4⅜	..	..
86,701	Stk.	Mar. 20	6	6	Do. 6 p.c. Red. Deb.	75—80	..	..
309,094	,,	Mar. 6	7	7	Uxbridge, Maidenhead, & Wycombe 5 p.c.	94—99	..	..
88,330	,,	,,	5	5	Do. 5 p.c. pref. . .	85—90	..	..
1,180,970	,,	—	—	—	Wandsworth, Wimbledon, and Epsom Cons. . .	108—113	..	110½—111
200,000	,,	Feb. 20	5	5	Do. 5 p.c. Pref. . . .	85—90	..	..
488,344	,,	Dec. 19	5	5	Do. 5 p.c. Deb. . . .	92—97	..	..

Quotations at:—*a.*—Bristol. *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *e.*—Sheffield. *f.*—The quotation is per £1 of Stock. * Ex. div. † Paid free of income-tax. ‡ For year.

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Works with Existing Hot-Water Systems.

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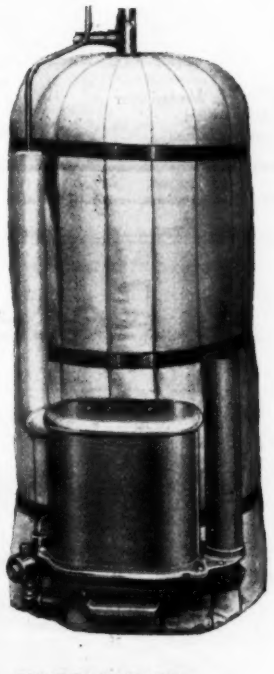

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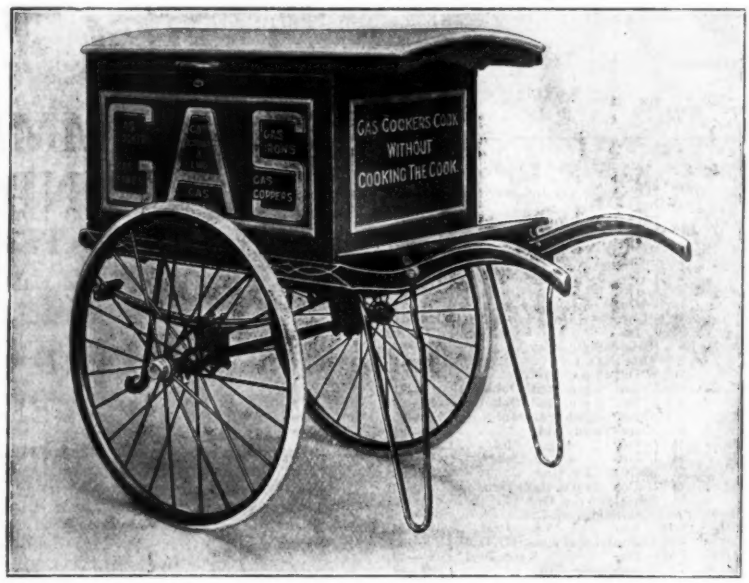
Hundreds in Use. ***TRY IT!***



Firs Makers of a Successful Prepayment Meter, and still in front.

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Special and distinctive features are incorporated in our High Capacity Meter.

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Established 1869

Nelson Meter Works, Miles Platting, MANCHESTER

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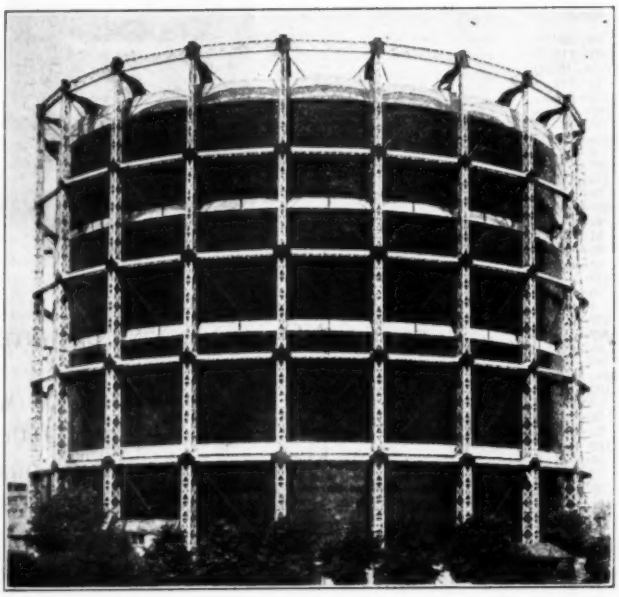

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Guide-Framed GASHOLDER

IN FOUR LIFTS OF

3,000,000 C.Ft. Capacity

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Hornsey, London, N.

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Orders to Alter or Stop PERMANENT ADVERTISEMENTS should be received by the FIRST POST on Monday.

UNDISPLAYED ADVERTISEMENTS: Situations Wanted, Six Lines and under (about 36 words), 3s.; each additional Line, 6d. Situations Vacant, Apparatus Wanted and for Sale, Contracts, Public Notices, &c., 9d. per Line—minimum, 4s. 6d. An additional charge of 6d. is made where replies are addressed c/o the "JOURNAL."

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FOR Motor Lorries and Railway Traffic can be seen erected at our Works READY FOR DELIVERY. Inspection by your Engineer invited and a test by your Local Inspector of Weights and Measures before delivery. Every machine a High-Class Engineering Product and fully guaranteed.

CHARLES ROSS, LIMITED, SHEFFIELD.

THOMAS DUXBURY AND CO.
16, DEANSGATE, MANCHESTER. PALACE CHAMBERS, WESTMINSTER, S.W. 1.
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Tins for Sale to Consumers.
In Bulk for Works Use.
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FRESH OXIDE {ON SALE / OR LOAN.

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FIRTH BLAKELEY, SONS, & CO., LTD., CHURCH-FENTON, YORKSHIRE.

EDUCATIONAL.

LEEDS UNIVERSITY.

Department of Coal Gas and Fuel Industries.

CORBET-WOODALL SCHOLARSHIP IN GAS ENGINEERING.

THE above-named Scholarship, of the value of £60 a Year, and tenable at the University for a period of Three Years with power of extension for a Fourth Year, is offered for Competition by Candidates desiring to enter the University in October, 1930, as students of Gas Engineering. Candidates are required to submit their applications not later than June 2nd to the Clerk to the Senate, The University, Leeds, from whom full particulars as to the conditions of award may be obtained.

Applicants for the recently advertised Cartwright Holmes Scholarship may also apply for this Scholarship.

APPOINTMENTS, &c., VACANT.

OXFORD AND DISTRICT GAS COMPANY.

THE above Company require the Ser- vices of a Young Man to act as ASSISTANT CHIEF CLERK.

Candidates must be under 35 years of age, and have been trained in the office of an up-to-date Gas Company, and be familiar with the various details connected therewith from counter work to drawing up the Balance-Sheet.

The Company has a Contributory Superannuation Fund together with a Co-Partnership Scheme.

Applications, stating Age, Married or Single, Experience, and Salary required, and accompanied with *copies* of Two recent Testimonials, to be addressed to the undersigned on or before May 20, 1930, and endorsed "Assistant Chief Clerk."

W. E. CATON, M.Inst.C.E.,
General Manager and Engineer.

Gas-Works,
Oxford,
April 29, 1930.

WANTED—Energetic Gas Salesman with Practical Experience, capable of calling on Gas Undertakings in connection with the Sale of Geysers and Gas Water Heaters.

Write, stating Age, full details of Experience, and Salary expected, to No. 8065, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

CONTRACTS OPEN.

WILMSLOW AND ALDERLEY EDGE GAS COMPANY.

TENDERS are invited for the Supply of 1000 Tons of BEST SCREENED GAS COAL and 1000 Tons of BEST WASHED SLACK delivered at Wilmslow Railway Station; delivered during the Twelve Months ending the 31st day of August, 1931.

Tenders, endorsed "Sealed Tenders," to be lodged with the undersigned on or before the 14th of May, 1930.

No Form of Tender will be issued, and the lowest or any Tender will not necessarily be accepted.

W. H. WELSH,
Secretary.

52, Brown Street,
Manchester,
May 2, 1930.

BOROUGH OF ILKESTON.

THE Gas Committee invite Tenders for the Supply and Erection of a SULPHATE OF AMMONIA PLANT capable of making One Ton per Day of Neutral Sulphate of Ammonia.

Contractors' own Specifications, Drawings, Prices, &c., to be sent to the undersigned not later than Monday, the 12th day of May, 1930.

Tenders should be endorsed "Sulphate of Ammonia Plant."

E. I. E. WILLIAMS,
Town Clerk.

Town Hall,
Ilkeston,
April 29, 1930.

BOROUGH OF ILKESTON.

THE Gas Committee invite Tenders for the Supply and Erection of a DEHYDRATION and NAPHTHALENE EXTRACTION PLANT at their Gas-Works.

Contractors' own Specifications and Prices to be sent to the undersigned not later than Monday, the 12th day of May, 1930.

Tenders should be endorsed "Naphthalene Plant."

E. I. E. WILLIAMS,
Town Clerk.

Town Hall,
Ilkeston,
April 29, 1930.

SUTTON-IN-ASHFIELD URBAN DISTRICT COUNCIL.

THE Gas and Water Departments of the above Council are prepared to receive TENDERS for the Supply and Delivery of the following Goods:

British PUDDLED IRON TUBES and FITTINGS (Steam), I.G.E. Specification.
ENGINE and CYLINDER OIL,

spread over a period of Twelve Months.

Tender Forms can be obtained on application to the Gas and Water Manager, Mr. J. J. Merrell, Council Offices, Station Road, Sutton-in-Ashfield.

Tenders, endorsed "Materials," to be sent so as to reach me not later than Monday, the 19th day of May, 1930.

By order,
LUTHER PEPPER,
Clerk to the Council.

Portland Square,
Sutton-in-Ashfield, Notts.,
April 26, 1930.

COUNTY BOROUGH OF WIGAN.
(GAS DEPARTMENT.)

TENDERS FOR COAL.

THE Corporation invite Tenders for the Supply of GAS SLACK, GAS NUTS, COBBLES, or SCREENED or UNSCREENED COAL for a period of Six or Twelve Months from the 1st July next.

Particulars and Forms of Tender may be obtained on application to Mr. F. Botley, Gas Engineer, Gas-Works, Wigan.

Contractors must comply with the Corporation's Standing Order No. 17 (Fair Contracts Clause), a copy of which Standing Order may be obtained on application to the undersigned.

Tenders, sealed and endorsed "Tenders for Gas Coal," to be delivered to the undersigned on or before the 19th inst.

The Corporation do not bind themselves to accept the lowest or any Tender.

WILLIAM HENRY TYRER,
Town Clerk.

Town Clerk's Office,
Municipal Buildings,
Wigan,
May 2, 1930.

STOCK ISSUES.

By Order of the Directors.

NEW ISSUE OF CAPITAL.

HARPENDEN DISTRICT GAS COMPANY.

ISSUE BY TENDER OF
£15,000
6 PER CENT. REDEEMABLE PREFERENCE STOCK,

redeemable at par on the 30th June, 1955, at a minimum price of par.

The last day for the receipt of Tenders is the 19th of May, 1930.

Prospectuses and Forms of Tender can be obtained from the SECRETARY OF THE COMPANY, or from Messrs. SEYMOUR PIERCE & CO., of 5, LOTHBURY, E.C. 2.

EDGAR H. MARTIN,
Secretary.

Southdown Road,
Harpenden, Herts,
May 2, 1930.

By Order of the Directors.

HAMPTON COURT GAS COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER
£40,000
5 PER CENT. REDEEMABLE DEBENTURE STOCK
to be redeemed at Par on the 1st of July, 1950.

Minimum Price of Issue, £95 per £100.

Yielding at that Price, allowing for redemption, £5 9s. 2d. per cent.

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Tuesday, 20th May) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

By Order of the Directors.

THE GOSPORT DISTRICT GAS COMPANY.

Messrs. A. & W. RICHARDS

are Instructed to OFFER FOR SALE BY TENDER
£10,000
CONSOLIDATED ORDINARY STOCK,

ranking for a Standard Dividend of 6 per cent. equally with existing similar Stock now receiving £7 7s. 9d. per cent.

Minimum Price of Issue, £105 per £100.

Yielding at that Price, £7 0s. 8d. per cent. Also
£3800
SIX PER CENT. REDEEMABLE DEBENTURE STOCK.

Minimum Price of Issue, Par.

To be redeemed at Par on the 1st January, 1940

Prospectus and Form of Tender (which latter must be sent in by 11 o'clock on Tuesday, the 13th of May) may be obtained of A. & W. RICHARDS, 37, WALBROOK, E.C. 4.

This Notice is inserted to comply with the requirements of the Committee of the Stock Exchange, London, and is not an invitation to subscribe for the Stock.

The Directors collectively and individually are responsible for the particulars advertised.

HARROGATE GAS COMPANY

(Incorporated by Special Act of Parliament, 1863. Further Acts and Orders, 1880, 1897, 1909, 1921, 1925, and 1927.)

CAPITAL AUTHORISED . . . £382,071 6 3
Borrowing powers one-half of Capital Raised.

RAISED:

	£	s. d.	£	s. d.
By Consolidated Stock . .	161,480	0 0		
„ Premiums	35,966	5 3		
			197 446	5 3
„ 4 p.ct. Preference Stock	35,840	0 0		
„ Premiums	1,539	0 0		
			37.379	0 0
„ 6 p.ct. Preference Stock, Redeemable 1937 . .	42,250	0 0		
Less discount . . .	2,250	0 0		
			40,000	0 0
			£274,825	5 3

The Consolidated Stock carries a maximum dividend of 10 p.ct., which has been regularly paid since the stock was consolidated in 1922. Prior to that date Statutory dividends had been earned for over 20 years.

RAISED BY LOAN CAPITAL:

	£	s. d.	£	s. d.
By 4½ p.ct. Debenture Stock			9.000	0 0
„ 5 p.ct. Debenture Stock	74,560	0 0		
„ Premiums less discount	8,835	8 6		
			83.395	8 6
„ 4 p.ct. Debenture Stock	500	0 0		
„ Premiums	3	0 0		
			503	0 0
„ 5 p.ct. Mortgages . . .			9,000	0 0
			£101,898	8 6

The 5 p.ct. Mortgages and the 4 p.ct. Debenture Stock will be redeemed out of the proceeds of the proposed issue of 5 per cent. Redeemable Debenture Stock, 1960.

All the above capital is fully paid.

The Consolidated Stock carries voting rights in accordance with the Companies Clauses Consolidation Act, 1845.

The Debenture Stocks and the Preference Stocks carry no voting rights.

Directors:

FRANCIS BARBER, Esq., Chairman.
JOHN W. KNOWLES, Esq., Deputy Chairman.
W. A. BOWER, Esq.
G. WOMERSLEY, Esq.
C. ARTHUR BARBER, Esq.

Secretary and Company's Office:

A. I. SEATON, A.C.I.S., Gas Offices, Harrogate.

Pursuant to a resolution passed at an Extraordinary General Meeting held on 19th February, 1929, the Directors have decided to issue £46,940 of 5 p.ct. Debenture Stock redeemable at par on the 1st July, 1960.

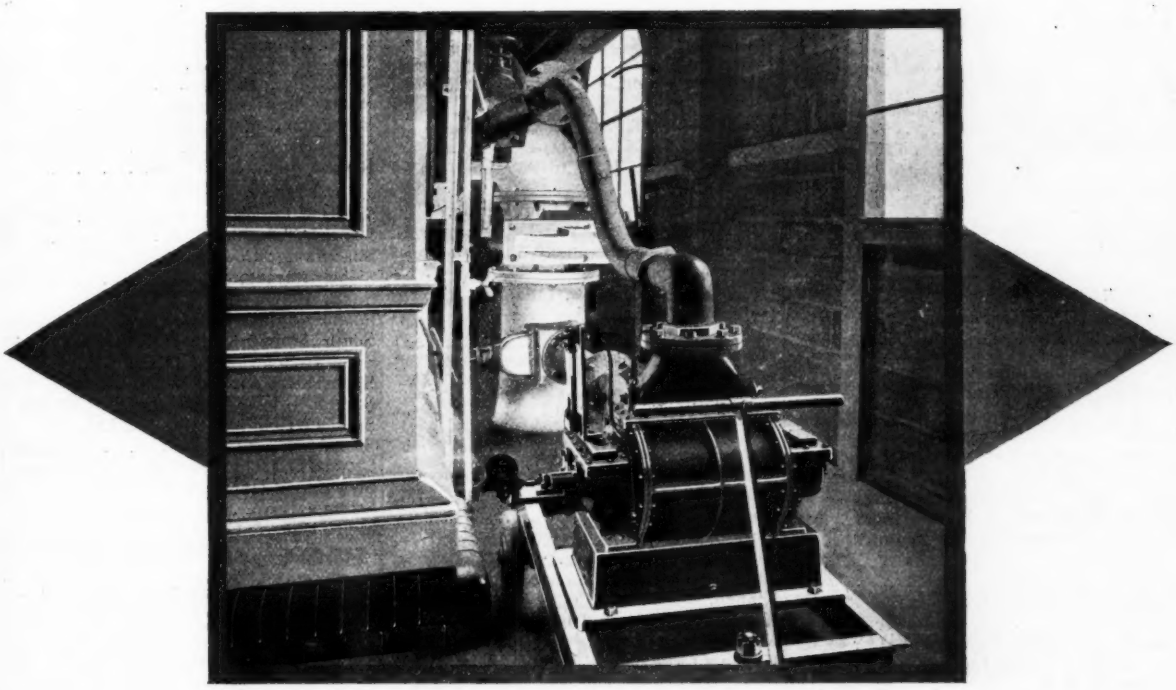
Interest payable on the 1st January and the 1st July in each year, the first payment being on the 1st July, 1930, and calculated from the date of payment for the Stock.

The Stock will be registered, and will be transferable in multiples of £10.

The Directors have instructed Messrs. Williamson, Fawcett, & Stirling, of 81-87, Gresham Street, London, E.C. 2, to dispose of this stock for them at £96 p.ct., subject to a commission of ½ p.ct.

April 30, 1930.

The British Built CONNERSVILLE POSITIVE DISPLACEMENT METER USED AS A TEST METER



This photograph shows a small Connersville Meter as used by the Bournemouth Gas & Water Company checking the accuracy of existing wet drum type station meters.

"Connersville Meters are ideal for this service because their displacement is unalterable and not dependent upon water levels or other uncontrollable factors.

"The accuracy of a Connersville Meter is not impaired with age, because its measuring chambers are composed of heavy accurately machined cast iron.

"The above Company has recently installed two large Connersville Station Meters."

W. C. HOLMES & Co., Ltd.,

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Telephone: 1573.
Telegrams: "Holmes, Huddersfield."

London Office:
119, Victoria Street, S.W. 1.
Telephone: 4505 Victoria.
Telegrams: "Ignitor, Sowest, London."

Founded 1850
HOLMES
CONNERSVILLE PLANT

The Connersville Meter is supplied only by W. C. Holmes & Co., Ltd., Sole Licencees for Great Britain, The Colonies, France, and Belgium.

INDEX TO "JOURNAL" ADVERTISERS.

	PAGE
Alder & Mackay, Ltd.	277
Aldridge & Ranken, Ltd.	278
Allan, Thomas, & Sons, Ltd.	323
Anglo-American Oil Company, Ltd.	329
Arden Hill & Co.	—
Armco International Corporation.	—
Asbestos Cement Building Products, Ltd.	—
Ashmore, Benson, Pease, & Co., Ltd.	Wrapper I.
Ashwell & Nesbit, Ltd.	—
Bagnall, John, & Sons, Ltd.	—
Bagshawe & Co., Ltd.	271
Bale & Church, Ltd.	319
Barclay, Andrew, Sons, & Co., Ltd.	276
Barrowfield Ironworks, Ltd.	—
Bell's Poilite & Everite Co., Ltd.	—
Berk, F. W., & Co., Ltd.	Wrapper I.
Blakeley (Firth), Sons, & Co., Ltd.	320
Braddock, J. & J.	Centre VIII., 319
Bray, George, & Co., Ltd.	—
British Aluminium Co., Ltd.	283
British Fibrocement Works, Ltd.	
British Furnaces, Ltd.	327
British Gas Purifying Materials Co.	319
British Thomson-Houston Co., Ltd.	—
Broadbent, Thos., & Son, Ltd.	—
Bugden, T., & Co.	—
Cambridge Instrument Co., Ltd.	Centre VIII.
Cannon Iron Foundries, Ltd.	—
Carless, Capel, & Leonard	—
Carron Company	Centre XI.
Celite Products Corporation	—
Chapman (Spencer) & Messel, Ltd.	319
Chemical Engineering and Wilton's Patent Furnace Co., Ltd.	280, 319
Clapham Bros., Ltd.	—
Clayton, Son, & Co., Ltd.	331
Cloake, A. G.	Centre VII.
Coleman Foundry Equipment Co.	
Cort, Robert, & Son, Ltd.	274
Cowan, W. & B.	Wrapper III.
Crossley Bros. (Bispham)	323
Crossley Brothers, Ltd. (Openshaw)	–
Cutler, Samuel, & Sons, Ltd.	318
Danks, H. & T. (Netherton), Ltd.	319
Davis Gas Stove Co., Ltd.	—
Davison & Partner, Ltd.	—
Dempster, R. & J., Ltd.	Wrapper I.
Dempster, R., & Sons., Ltd.	Centre II., 320
Donkin Co., Ltd. (The Bryan)	Wrapper II.
Dougall's Gas Meters, Ltd.	—
Drakes, Ltd.	–
Drayton Regulator and Instrument Co., Ltd.	—
Dry Gasholders, Ltd.	—
Duckham, Alexander, & Co., Ltd.	—
Duxbury, Thomas, & Co.	319
Eagle Range and Grate Co.	—
Economic Gas Boiler Co., Ltd.	279
Economical Gas Apparatus Construction Company, Ltd.	—
Ellis, Key, & Co.	–
Evans, Joseph, & Son (Wolverhampton), Ltd.	329
Expanded Metal Company, Ltd.	—
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Fletcher, Russell, & Co., Ltd.	—
Foster & Pullen, Ltd.	272
Foster Bros., Ltd.	—
Fraser & Chalmers Engineering Works	—
Gas Chambers and Coke Ovens, Ltd.	273
Gas Purification and Chemical Co.	Wrapper I., 319
Gas Meter Co., Ltd.	Wrapper IV., 280
General Gas Appliances, Ltd.	317
General Refractories, Ltd.	326
Gibbons Bros., Ltd.	–
Gledhill Brook Time Recorders	—
Glenboig Union Fireclay Co., Ltd.	325
Glover, George, & Co., Ltd.	269
Glover, Thos., & Co., Ltd.	284
Goodall, Clayton, & Co., Ltd.	Centre VII.
Grant, David, & Co.	326
Green & Boulding, Ltd.	323
Griffin & Tatlock, Ltd.	—
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Hall, John, & Co., Stourbridge, Ltd.	328
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Harris & Pearson	328
Head, Wrightson, & Co., Ltd.	Wrapper I., 328
Heathman, J. H.	—
Hislop, R. & G.	329
Holmes, W. C., & Co., Ltd.	Wrapper I., 321
Holst, K., & Co.	276
Horseley Bridge and Engineering Company, Ltd.	Wrapper II.
Horstmann Gear Company, Ltd.	—
Hortonspheres	—
Humphreys & Glasgow, Ltd.	282
Hutchinson Bros., Ltd.	—
Institute of Chemistry	—
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Keith, James, & Blackman Company, Ltd.	332
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King's Patent Agency	319
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Manchester Oxide Co., Ltd.	319
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Oughtibridge Silica Firebrick Co.	277
Parkinson Stove Co., Ltd.	Centre III.
Parkinson, W., & Co.	272, 284
Patent Retorts, Ltd.	328
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Peckett & Sons, Ltd.	324
Peebles & Co., Ltd.	—
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Phillips, J. W. & C. J., Ltd.	323
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Pulsometer Engineering Company	Wrapper IV.
Purimachos Ltd.	–
Quasi-Arc Co., Ltd.	—
Radiation Ltd.	Centre IV., V., 281
Raschig, Dr. F., G.m.b.H.	—
Reavell & Co., Ltd.	330
Renold, Hans, Ltd.	—
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Ruscoe, John, & Co., Ltd.	—
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Wright, Alex., and Co., Ltd.	Centre XI.
Wright, John, & Co.	281

Appointments Vacant & Wanted	320
Company Notices	—
Contracts Open	320
Educational	320
Patent Notices, &c.	323
Plant, &c., for Sale and Wanted	323
Stock Issue	316, 320

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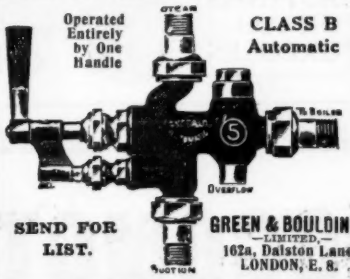

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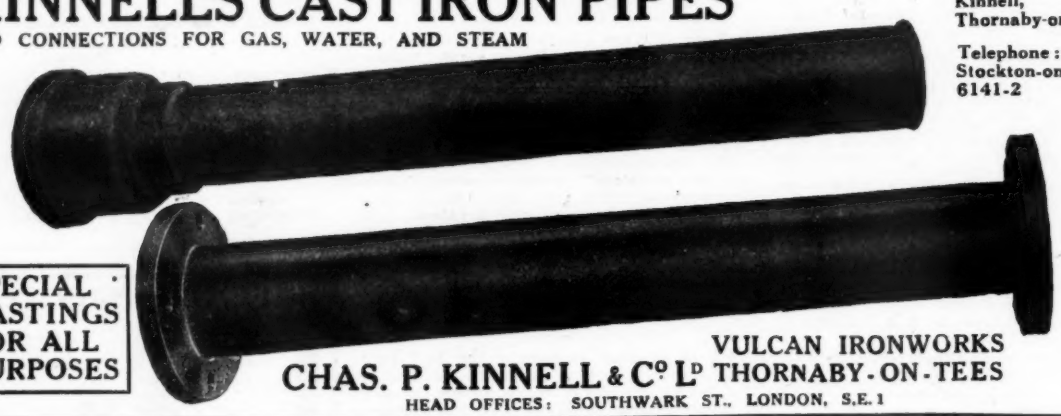

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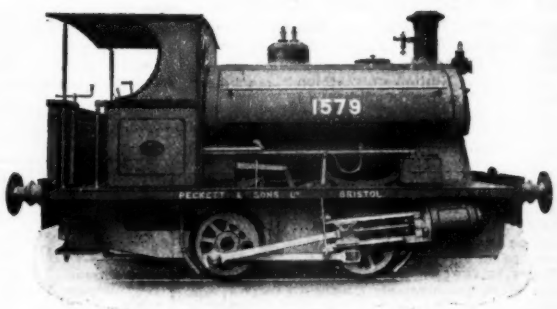

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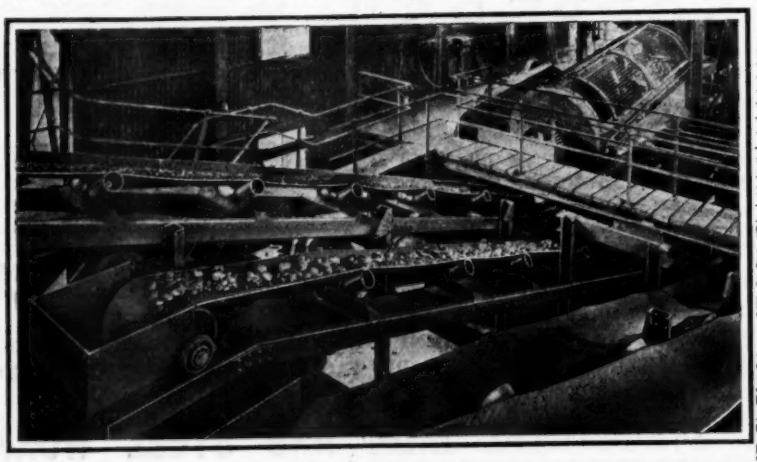

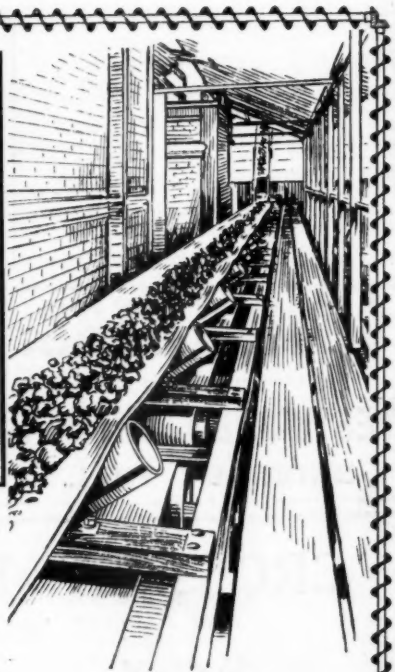

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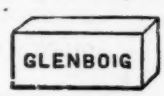
TRADE 

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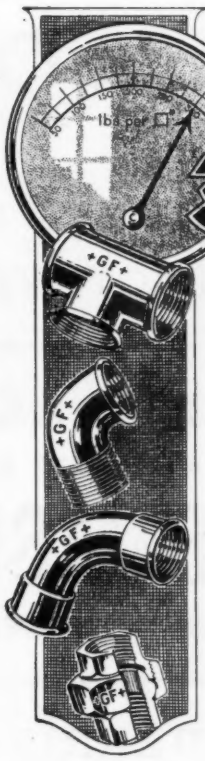

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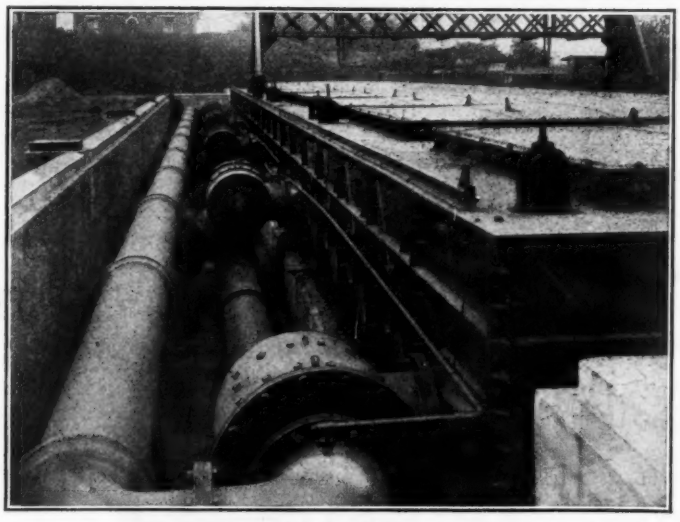

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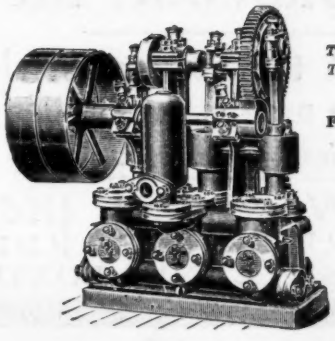

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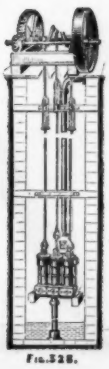

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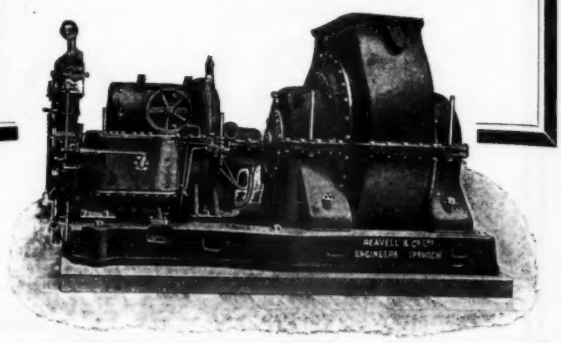

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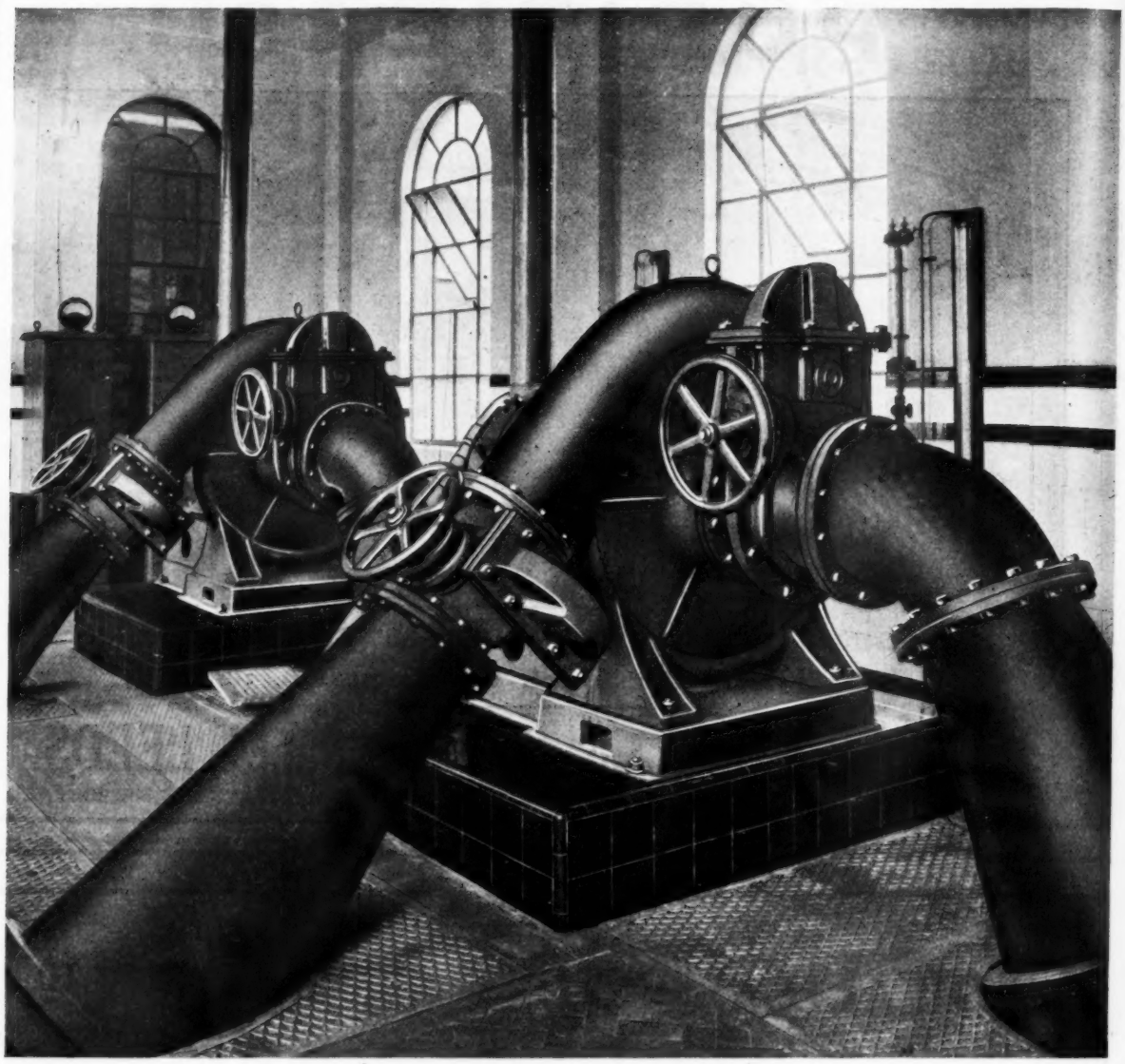

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